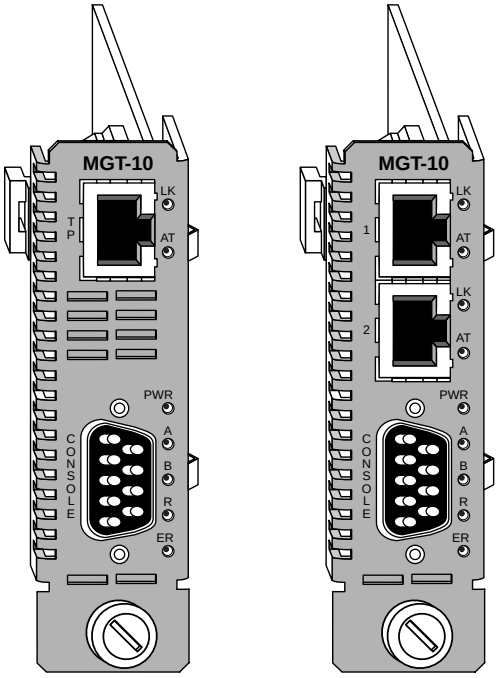
METRObility
optical systems

# COMMAND LINE INTERFACE




## *Reference Guide*

Models: 7501-M / R501-M / R502-M

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## Command Line Interface Reference Guide

# Introduction

**This two-part document contains installation procedures and console** commands necessary for the operation of the Metrobility 7501-M, R501-M, and R502-M management cards. The first section describes how to connect the card to the network and to boot up for SNMP management. The second section describes the commands available to three privilege classes of users:

- Guest
- Admin
- Root

Guest users can view information about the system, but cannot modify any of the fields. Admin users can monitor and configure the system, including its modules and ports. Root users, under the direction of a Metrobility support engineer, can customize or recover the system and internal file system.

The three user privileges correspond to a login and password of the same name. This list is cumulative (i.e., Admin privileges include Guest privileges, and Root privileges include all commands).

The Console Commands section is organized by the three privilege groups. The commands are listed by type (set, show, etc.). Use the comprehensive Table of Contents to locate documentation for a particular command.

## Notation Conventions

This section describes the conventions used in this document.

**Font Conventions**

Times — Times is the default font used for general text.

Arial — Arial is used for program examples, prompt responses, and other system output.

**Symbol Conventions**

The following symbol conventions are used in this manual.

< > — Angle brackets indicate that the enclosed information is a required entry.

[ ] — Square brackets indicate that the enclosed information is optional.

| — A vertical bar separating two text items indicates that either term may be entered as a value.

**Command Field Conventions**

<chassis> — Chassis number in the stack.

| | |
|---|---|
| <module> | Chassis slot number where the line card is installed. |
| [-converter] | Media converter number on a fixed port chassis. |
| <port> | Port number on the line card. |
| <remote> | Remote card number connected to an access line card. |
| <remoteport> | Port number on a remote card connected to an access line card. |

## *Product Overview*

The management card is the SNMP agent for the chassis. Embedded in the card is the WebBeacon™ software for Web-based management of your devices. Used in conjunction with Metrobility's NetBeacon™ or WebBeacon management software, or any SNMP application, the card delivers individual board status directly to the network administrator. Follow the console commands documented in this guide to configure the cards in the chassis.

**7501-M and R501-M Ethernet Management Modules**

The x501-M Ethernet management module provides a single 10Base-T interface for remote SNMP management. The module includes a 33MHz processor and offers 8Mbytes of memory. Connected through the backplane to other modules in the chassis, the x501-M uses the management software to access and report statistical information. Thus, the network administrator receives information on network operations via a PC instead of having to make multiple trips to the wiring closet. In a stacked chassis configuration, the x501-M is used in the slave chassis that is connected to a master chassis.

**R502-M Dual-Port Ethernet Management Card**

Developed for the Radiance Optical Ethernet System, the R502-M supports all Metrobility chassis and both access line cards and interface line cards. The R502-M offers a 50MHz processor and 32Mbytes memory and is required for the NetBeacon database plug-in. Each Ethernet interface has a unique IP address and subnet mask, and the management software can access all MIB data through either interface. The second interface can be connected to a stack of up to seven chassis using the Metrobility chassis stacking line card or an external hub. In a stacked chassis configuration, the R502-M must be used as the master management card. R502-Ms may also be used in the slave chassis in the stack.

**This section describes how to install the management line card into the chassis, connect to the network and stack, and boot up for SNMP management.**

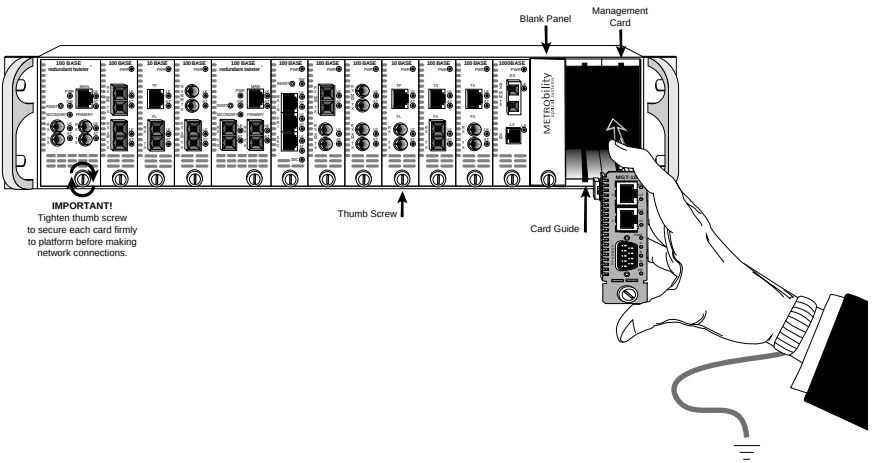
***NOTE:*** *Electrostatic discharge precautions should be taken when handling any line card. Proper grounding is recommended (i.e., wear a wrist strap).*

## Install the Management Line Card

The management card must be installed in the slot furthest to the right of the chassis. You may install it in either slot of a two-slot chassis. All other line cards may be installed into any slot.

Follow the simple steps below to install the management card:

- Grasp the card by the front panel as shown.
- Line the edges of the card with the slot guides and slide the card in until the edges are flush and even with the front of the unit. Do not force the card into the slot unnecessarily. It should slide in easily and evenly.
- Secure by turning the thumb screw clockwise until snug. The card is now ready for connection to the network.




**CAUTION:** *Danger of explosion if the battery on the management card is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.*

## Connect to the Network

**Management Card Connections**

The management card supports 10Base-T Ethernet.

- Using a standard Category 3 or 5 UTP cable, connect the management card to your network. If you are installing an R502-M, connect Port 1 to your network. Although the port can be configured for either full or half duplex, half duplex is recommended. Refer to the Console Commands section for a detailed description of configuration commands.

- Using the supplied null-modem console cable, connect the male DB-9 port on the management card to the serial port on your PC.

## Connect to the Stack

**R502-M Management Card Only**

The R502-M management card supports two 10Base-T Ethernet connections. When connecting to your network, use a standard Category 3, 4 or 5 UTP cable.

**Master Chassis**

- Connect port 1 of the master R502-M to your network. For proper operation, the port is preset to half duplex and should not be changed.

- Connect port 2 of the master R502-M to a Metrobility chassis stacking line card or to a hub or switch that is NOT on your network. Port 2 is preset to half duplex and should not be changed.

- Using the supplied null-modem console cable, connect the male DB-9 port on the master R502-M to the serial port on your PC.

**Slave Chassis**

- For each slave chassis you want to include in the stack, connect the Ethernet port on its management card to the same chassis stacking card, hub, or switch to which you connected the master R502-M. This provides the communication path between the master R502-M and the network stack.

  When using an R502-M in the slave position, use Port 1 to make the Ethernet connection to the stack, and disable Port 2 via the boot configuration menu. (See page 17.)

## *Boot Up for SNMP Management*

Management of the Metrobility chassis can be provided through our NetBeacon or WebBeacon software, or any SNMP network management application, via a PC. SNMP is supported on many general network platforms: SunNet Manager, HP OpenView for UNIX, HP OpenView for NT, SNMPc and others. Refer to the Console Commands section for a detailed description of configuration commands.

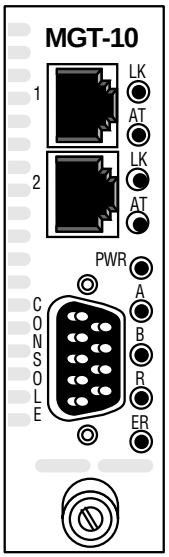
The PC Terminal Session Parameters are as follows:

- 9600 Baud / 8 data bits / 1 stop bit / no parity / no flow control

**Power-on Boot Indications**

Following power-up, the boot image is automatically executed. It starts by performing a system initialization, followed by diagnostic tests. During this process, the Run LED is off and the Error LED blinks. After diagnostics are complete, if a failure has occurred, the Error LED remains on. The Run LED does not illuminate until the operating system is successfully started.

**Management Line Card LED Indicators**




| LED Name | Label | Status | Indication |
|---|---|---|---|
| Ethernet Link | LK | ON | LINK present |
| Ethernet ACT | AT | ON | LINK present and receiving packet |
| Power | PWR | ON | Management line card is receiving power |
| Power Supply A | A | ON | Power supply A is ON |
| Power Supply B | B | ON | Power supply B is ON |
| Run | R | OFF | Performing diagnostics or loading OS |
| | | ON | Successful OS load and system operating normally |
| Error | ER | ON (steady) | Diagnostic or boot failure |
| | | ON (blinking) | Performing diagnostics or intializing system |
| | | OFF | Normal operation |

The following is an example of the console display information:

```
Metrobility Optical Systems Inc. Boot Application : 3.4.0
Executing Power-On Selftest.....
_____________________________________________________________

NETWORK INTERFACE PARAMETERS:
  LAN IP address will be obtained from BOOTP
HARDWARE PARAMETERS:
  Serial channels will use a baud rate of 9600
HARDWARE PARAMETERS:
  R502-M Mpc850 (Rev 0.1) CPU running at 50 Mhz with 10 Mhz input clock
     DRAM       32 Mbytes
     NVRAM       8 Kbytes
     FLASH       8 Mbytes
  This board's Primary Ethernet MAC address is 0:0:0:0:0:0
  The Primary Ethernet port will run in Half duplex mode
  The board's Secondary Ethernet MAC address is 0:0:0:0:0:0
  The Secondary Ethernet port will run in Half duplex mode

M7500 BOOTLOADER PARAMETERS:
  Chassis is not in a Stack
  Name of the Boot image is boot.bin
  Boot via the DISK Bootloader
  Disk device type is FLASH
  ID of the disk to be used is 0
  Volume is pHILE formatted
  The file to load and start is corepm.biz
  After board is reset, start-up code will wait 10 seconds
_____________________________________________________________

To change any of this, press any key within 10 seconds

(M)odify any of this or (C)ontinue? [M] c

Verifying volume.
```

If you don't have a BOOTP server, or if you don't have a BOOTP entry for this system, you will see the following message:

```
BOOTP request failed: Check for a RARP server/Network Error
```

If you wish to set up your BOOTP server, you must provide an IP address, subnet mask, and default gateway. If you do not wish to use BOOTP, you can hit any key and modify the boot parameters.

**Configuration of the Boot Loader**

The boot loader can be configured to obtain its image and configuration information from three different sources: manually through the boot loader configuration dialog, through a BOOTP server, or partially configured through a RARP server.

To configure the boot load type, press any key within the designated time to access the system configuration menus.

| Boot Option | Description |
|---|---|
| Manual Config: File System | Requires the user to input system configuration information, then starts the operating system from the on-board file system using that information. System configuration information is saved through power cycles. |
| BOOTP | Contacts a BOOTP server in your network to get system information used to boot. |
| Manual Config: TFTP Boot | Requires the user to input system configuration information, then starts the operating system from a TFTP server using that information. System configuration information is saved through power cycles. |

The following configuration information is required:

| Name IP | When Required | Description |
|---|---|---|
| IP Address | BOOTP, File, TFTP | The IP address of the system is required to start the operating system. |
| | | If BOOTP is used, the IP address must be set to 0.0.0.1 |
| | | If RARP is used to get the IP address, 0.0.0.0 must be placed in the IP address field. |
| IP Subnet Mask | BOOTP, File, TFTP | The IP subnet mask is required to start the operating system. |
| Boot Type | BOOTP, File, TFTP | Used to determine if the system will load the operating system from the local file system or from a networked file system via TFTP. |
| File Name | TFTP | If the file is to be loaded via TFTP, the user must enter the operating system path and file name on the remote file system. |
| Default Gateway | if a default gateway is in your network | Your network default router gateway. |

**Manual Configuration**

The following is an example of the console display information:

```
Metrobility Optical Systems Inc. Boot Application : 3.4.0
Executing Power-On Selftest.....
_____________________________________________________
NETWORK INTERFACE PARAMETERS:
  LAN IP address will be obtained from BOOTP
HARDWARE PARAMETERS:
  Serial channels will use a baud rate of 9600
HARDWARE PARAMETERS:
  R502-M Mpc850 (Rev 0.1) CPU running at 50 Mhz with 10 Mhz input clock
     DRAM        32 Mbytes
     NVRAM        8 Kbytes
     FLASH        8 Mbytes
  This board's Primary Ethernet hardware address is 0:0:0:0:0:0
  The Primary Ethernet port will run in Half duplex mode
  This board's Secondary Ethernet hardware address is 0:0:0:0:0:0
  The Secondary Ethernet port will run in Half duplex mode
M7500 BOOTLOADER PARAMETERS:
  Chassis is not in a Stack
  Name of the Boot image is boot.bin
  Boot via the TFTP Bootloader
  IP ADDRESS of the TFTP host RARP server
  The file to download and start is corepm.biz
  After board is reset, start-up code will wait 10 seconds
_____________________________________________________
To change any of this, press any key within 10 seconds

(M)odify any of this or (C)ontinue? [M]
```

Each question that the boot loader poses has a default response contained within brackets [ ]. If the system has not been configured, the brackets contain the factory default values. If the system has been configured, the system saves the last used values.

For each of the following questions, you can press <Return> to select the value shown in braces, or you can enter a new value.

```
NETWORK INTERFACE PARAMETERS:
This board's Primary LAN IP address (0.0.0.0 = RARP, 0.0.0.1 = BOOTP)? [0.0.0.1]
```

Management software requires IP protocols (SNMP and FTP) to work properly. For this reason, the boot loader prompts you for an IP address. IP addresses can be manually assigned, or assigned via a RARP or BOOTP server within the network to which the chassis is connected. If you are configuring an R502-M as

the first chassis in a stack, you must do it manually.

To set up the system using BOOTP, enter <0.0.0.1> in the board's LAN IP address field. To configure the system using RARP, enter <0.0.0.0> in the board's LAN IP address field.

If you are configuring the system manually, the following question is asked. Use the default, or enter a new subnet mask.

```
Subnet mask for Primary LAN (0.0.0.0 for none)? [0.0.0.0]
```

For the R502-M, you are offered the option of enabling or disabling the secondary Ethernet port. If you are configuring a master R502-M for a stack, enter <Y> to enable the port. If you are configuring a slave R502-M for a stack, you must enter <N>.

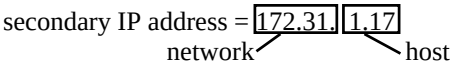
```
Do you want a Secondary LAN interface? [Y]
```

If you chose to enable the secondary LAN interface, the same two questions are repeated for the port.

```
This board's Secondary LAN IP address (0.0.0.0 = RARP, 0.0.0.1 = BOOTP)? [0.0.0.1]
Subnet mask for Secondary LAN (0.0.0.0 for none)? [0.0.0.0]
```

**Stack Configuration**

If you are configuring for a stack, the board's secondary LAN IP address must be a valid class B address, according to RFC 1597.




- Set the network half of the address between 172.16.0.0 and 172.31.0.0.
- Set the host half of the address to be the chassis's stack position number followed by the slot number of its management card.
- All other chassis in the same stack must have an IP address with the same network portion that was assigned to the R502-M's secondary interface. Increment the stack positions by one. Up to seven chassis are supported in each stack.

  Example: 172.16.1.17 stack position 1, slot 17 (17-slot chassis)
  172.16.2.12 stack position 2, slot 12 (12-slot chassis)
  172.16.3.1 stack position 3, slot 1 (2-slot chassis)

- After manually configuring the first chassis in the stack, an alternative method of adding other chassis is to use the administrative level command: **bootp -set**. Refer to the Console Commands section for further details.

The following questions pertain to the board's primary interface.

```
Should there be a default gateway for packet routing? [Y]
What is its IP address? [0.0.0.0]
```

The boot loader poses the following questions for hardware parameters:

```
HARDWARE PARAMETERS:
Baud rate for serial channels [9600]
```

```
HARDWARE PARAMETERS:
Do you want to change the board's Primary Ethernet MAC address? [N]
Do you want to change the board's Secondary Ethernet MAC address? [N]
```

The following questions relate to stacking and load type.

NOTE: • The x501-M management module does not support stacking.
• The maximum number of chassis supported in a stack is seven (7).

```
M7500 BOOTLOADER PARAMETERS:
Is this Chassis in a Stack? [Y]
Stack Position (1-7)? [1]
Boot from (D)isk or via (T)ftp over the network? [D]
Transfer file to disk via TFTP? [N]
Name of the file to load and start? [corepm.biz]
How long (in seconds) should CPU delay before starting up? [10]
```

The boot loader allows the operating system to be loaded from either the on-board file system or from a network accessible file system via TFTP. The on-board file system is the default method of image load.

If you select to load via TFTP, the boot loader poses these remaining questions:

```
Transfer file to disk via TFTP? [N] y
IP address of the server to copy file from? [0.0.0.0] 100.132.65.23
Name of the file to transfer? [corepm.biz]
Volume needs formatting? [N]
How long (in seconds) should CPU delay before starting up? [10]
```

NOTE: This method of operating system load is primarily for loading a new operating system version, without deleting the old version from the system.

Once the configuration is complete, the boot loader displays your responses in the start-up mode console description. You can either continue with the boot process or change any configuration parameters.

```
NETWORK INTERFACE PARAMETERS:
   IP address on Primary LAN is 100.132.60.155
   Primary LAN interface's subnet mask is 255.255.255.0
   IP address on Secondary LAN is 100.168.0.1
   Secondary LAN interface's subnet mask is 255.255.255.0
   IP address of default gateway to other networks is 100.132.60.1
HARDWARE PARAMETERS:
   Serial channels will use a baud rate of 9600
HARDWARE PARAMETERS:
   R502-M Mpc850 (Rev 0.1) CPU running at 50 Mhz with 10 Mhz input clock
    DRAM    32 Mbytes
    NVRAM    8 Kbytes
    FLASH    8 Mbytes
  This board's Primary Ethernet MAC address is 0:10:9f:14:C:12
  The Primary Ethernet port will run in Half duplex mode
  This board's Secondary Ethernet MAC address is 0:10:9f:14:C:13
  The Secondary Ethernet port will run in Half duplex mode
M7500 BOOTLOADER PARAMETERS:
  Stack Position is 1
  Name of the Boot image is boot.bin
  Boot via the DISK Bootloader
  Disk device type is FLASH
  ID of the disk to be used is 0
  Volume is pHILE formatted
  The file to download and start is corepm.biz
  After board is reset, start-up code will wait 10 seconds
_____________________________________________________
(M)odify any of this or (C)ontinue? [M] c
```

If you are satisfied with the configuration parameters, type <c> to continue with the boot process. The boot process automatically continues if no key is pressed within 10 seconds.

```
Verifying volume.

FLASH driver initialized...
Starting disk download of 44.0.0/corepm.biz...
Decompressing ... One moment...
Each . equals 10K bytes processed (uncompressed)
.........
.........
.........
```

.....
.....
.....
.....
.....
.....
.....
.....
Decompression Complete!
Disk load completed

Transferring control to the downloaded code

**Boot Completion Indications**

The operating system displays a number of log messages on the screen as it comes up. The following is an example of that output:

ROOT :00000000:INFO (DEV_PSEUDO initialized)
ROOT :00000000:INFO (DEV_TFTP initialized)
ROOT :00000000:INFO (DEV_TIMER initialized)
ROOT :00000000:INFO (DEV_TFTP initialized)
ROOT :00000000:INFO (DEV_FLASH initialized)
ROOT :00000000:INFO (DEV_TOD initialized)
ROOT :00000000:INFO (DEV_HTTP initialized)
ROOT :00000000:INFO (DEV_I2C initialized)
ROOT :00000000:INFO (DEV_LED initialized)
ROOT :00000000:INFO (DEV_PHYSICAL initialized)
ROOT :00000000:INFO (Locking boot sectors)
ROOT :00000000:INFO (Image WebBeacon_corepm built on May 12 2003 at 11:09:48 by bldmstr@ROCKME)
ROOT :00000000:INFO (Revision: 3.4.0)
ROOT :00000000:INFO (Flash File System mounted on device 44.0)
ROOT :00000000:INFO (Telnet daemon initialized)
ROOT :00000000:INFO (TELNET daemon enabled)
ROOT :00000000:INFO (Ftp daemon initialized)
ROOT :00000000:INFO (FTP daemon enabled)
ROOT :00000000:INFO (Dnsd daemon initialized)
ROOT :00000000:INFO (Httpd daemon initialized)
CMGR :00000000:INFO (R131-13 Inserted in IoSlot1_1)
CMGR :00000000:INFO (R502-M Inserted in IoSlot1_2)
CMGR :00000000:INFO (AC Power Supply Inserted in PS Slot A)
CMGR :00000000:INFO (AC Power Supply Inserted in PS Slot B)

```
+*********************************************************************************************+
* Metrobility 17 Slot Chassis 19"                                                             *
*                                                                                             *
*                                                                                             *
* Fri May  9 19:29:42 2003                                                                    *
* Version: 3.4.0 (May 12 2003)                                                                *
* Serial Number: A001200048                                                                   *
*                                                                                             *
* Copyright 1998 - 2003 Metrobility Optical Systems, Inc.                                     *
+*********************************************************************************************+
login:
```

**Login Instructions**
To log on to the network, do the following:

- Type your user name at the login prompt and hit <Enter>. The three default names are **guest**, **admin** and **root**.

- Type your password at the Password prompt and hit <Enter>. The default passwords are the same as their corresponding user names. Passwords are not displayed.

To view the current user/password list, delete a user or add a new user, refer to the ‘user’ commands, which are admin privilege commands.

Example:

```
login: admin

Password:
sh05 :00000000:INFO (User <Administrator> logged in)

Console>user -all
admin:~N6H1~B:11:11:Administrator:/:psh
guest:~H~Dh‘1:21:21:Guest:/:psh
Console>
```

## CLI Access via Modem

To access the Command Line Interface (CLI) using a modem, the modem must be configured properly to support remote communications with the console port on the management card.

To configure your modem, use the AT command set or the software provided by the modem manufacturer. The settings required to enable a Zoom/Fax Modem V.34X+ Model 2836 to communicate with a Metrobility management card are shown in the example below. Please refer to your modem's manual for compatible AT commands.

**Modem Configuration (Zoom/Fax Modem V.34X+ Model 2836 shown)**

**E0** Disable echo.
**N1** Enable automode detection.
**Q1** Disable result codes to the DTE (data-terminal equipment).
**X0** Disable monitoring of busy tones.
**&C0** RLSD (received line signal detector) remains ON at all times.
**&D0** Ignore DTR (data terminal ready); must also set &Q5.
**&K0** Disable flow control.
**&Q5** Modem will try to negotiate an error-corrected link.
**&R1** CTS (clear to send) is always ON; RTS (ready to send) is ignored.
**&S1** DSR (data set ready) becomes active after answer tone is detected, and inactive if carrier is lost.
**&T5** Disable digital loopback.
**&X0** Select internal timing.
**S00** Set this to the number of rings for auto-answer; number must be greater than zero.

**Console Port Configuration**

The console port on the management card does not use hardware control lines, nor does it support software flow control. The port is permanently set to the following configuration:

**Speed** 9600 baud
**Data Bits** 8
**Parity** none
**Stop Bits** 1

*Caution: There is a potential risk of opening a security hole if the modem is disconnected before logging off from the CLI session.*

In the following example, a Zoom/Fax Modem V.34X+ Model 2836 is connected to a Windows PC using Hyperterminal with AT commands.

ate1 (turns on echo)

at&vn (displays active and saved configurations)
B1 E0 L1 M0 N1 Q1 T V1 W0 X0 Y0 &C0 &D0 &G0 &J0 &K0 &Q5 &R1 &S1 &T5 &X0 &Y1
S00:001 S01:000 S02:043 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006
S10:014 S11:095 S12:050 S18:000 S25:005 S26:001 S36:007 S37:000 S38:020 S44:020
S46:138 S48:007 S95:000

ate0 (turns off echo)

## *Persistence Data*

When a chassis is initially started, the management line card polls all installed cards and saves their part numbers and hardware switch settings.

When you change a switch setting via software, the card's part number, hardware switch settings and new software setting are saved.

If you remove the card and insert a new card into its slot, one of the following occurs:

1) If the part number and hardware switch settings match, the software switch settings stay the same.

2) If the part number matches but the hardware switch settings do not, the new hardware switch settings take precedence. All other software settings remain unchanged.

3) If the part number does not match, all hardware settings for the new card take precedence and the persistence file is updated with the new data.

## *Upgrade Procedures*

There are several ways of upgrading the embedded code*. This section describes three methods to upgrade the software.

- Command Line Interface (CLI) via FTP
- BOOT Process (to execute embedded software that does not reside on the management card, or to transfer embedded software to the management card via TFTP)
- NetBeacon Management Software

Metrobility does not support storing more than two copies of corepm.biz. If the Flash File System (FFS) is full, we cannot guarantee operation. In some instances, a full file system can corrupt the FFS. If the file system's limit is approached, a warning message will appear on the console asking you to delete unnecessary files.

### Upgrade Firmware Via FTP

To load the image file (corepm.biz) and boot code (boot.bin) via FTP on a local console, do the following:

1) Copy the corepm.biz and boot.bin files into a directory accessible via FTP.

2) Log on to the console at the administrator or root level.

3) FTP to the system where the corepm.biz and boot.bin files reside.

4) Set the FTP session into binary mode.

5) Go into the directory that contains the corepm.biz and boot.bin files.

Upgrading to a major software release (e.g., from version 2.1 to 3.x) requires both files to be updated. For most other software upgrades, you may download only the image file. Upgrading from Release 3.0 to 3.3 requires both files to be updated.

6) Type "get corepm.biz" and "get boot.bin".
   NOTE: Do NOT reset or power-down the system while upgrading software! The file system may go into an unknown state causing boot failures.

7) Once the download is complete, quit the FTP session.

---

* When upgrading software to management cards in a stack, make sure that the same software version is installed within that stack (e.g., version 3.1 code cannot be mixed with 3.0.1 code in the same stack).

8) If you downloaded the boot code, type “set module image boot <chassis> <module> file://[path/]boot.bin” (e.g., set module image boot 1 17 file:// boot.bin).
NOTE: Do not to interrupt the process.

9) Reboot the management card by issuing the command: “reset module <chassis> <module>” (e.g., reset module 1 17).
NOTE: Do NOT use the “reset chassis” command. After successfully rebooting the management card, you are done. Both boot.bin and corepm.biz will be running.

## Firmware Boot Process via TFTP

*Continue with the following steps only AFTER copying boot.bin onto the management card.*

The initial boot process provides two options for upgrading files via TFTP. One option enables you to execute a file that does not reside on the management card. This method does not load the file onto the management card. Another option allows you to transfer the file onto the management card and then execute it.

1) Copy the corepm.biz file into a directory accessible via TFTP.

2) Reset the management card.

3) During the initial boot process, hit the <space bar>.

4) Select Modify by typing <M>.

5) Make sure the Ethernet port is enabled, and that the network interface and hardware parameters are set.

   Continue with “Upgrading from a TFTP Server” or “Upgrading from Disk.”

**Upgrading from a TFTP Server**
To execute software that resides on a TFTP server, do the following:

A) When asked whether to boot from disk or via TFTP over the network, select TFTP by typing <T>.

B) Enter the IP address of the TFTP server where corepm.biz is located.

C) Enter the directory and filename for corepm.biz (e.g., \tftpboot\corepm.biz for Windows or /tftpboot/corepm.biz for Unix).

D) Complete the boot configuration dialog. At the end of the dialog, continue the boot process by typing <C>. The file will be executed, but not loaded to disk.

**Upgrading from Disk**
Continue with the following steps after performing steps 1 through 5 in "Firmware Boot Process Via TFTP." This section describes how to transfer the embedded software to the management card via TFTP.

A) When asked whether to boot from disk or via TFTP over the network, select disk by typing <D>.

B) Type <Y> when prompted with "Transfer file to disk via TFTP?"

C) Enter the IP address of the system where corepm.biz resides.

D) Enter the directory and filename for corepm.biz (e.g., \tftpboot\corepm.biz for Windows or /tftpboot/corepm.biz for Unix).

E) Complete the boot configuration dialog. At the end of the dialog, continue the boot process by typing <C>. The file will be loaded to disk and executed.

## NetBeacon Management Software

For detailed instructions on how to download the embedded software and boot code through NetBeacon, refer to the *NetBeacon Element Management Software Installation & User Guide.*

## *Obtaining Metrobility MIB and Firmware Files*

To get the latest Metrobility Management Information Base (MIB) and firmware files, go to http://www.metrobility.com/support/software.htm. Follow the on-screen instructions to download the files.

# Guest/Admin/Root Privilege Overview

### *Guest Privilege*
### Login Guest

cd
chassis
clrscr
exit
help
history
ls
module
ping
port
pwd
pwv
quit
remote
remoteport
top
up
show acl
show arp
show chassis
show help
show interface
show ip help
show ip routes
show ip stats
show log all
show log details
show log help
show log severities
show log summary
show log tail
show mac
show module
show motd
show netstat active
show netstat all
show netstat help
show netstat interface
show netstat routes
show netstat snmp
show netstat statistics
show port
show stats rmon
show system
show time
show trap controls
show trap destination
show trap help

### *Admin Privilege*
### Login Admin

bootp -all
bootp -delete
bootp -help
bootp -set

clear acl
clear arp
clear help
clear ip help
clear ip route
clear log
clear motd
clear snmp community
clear snmp help
clear trap destination
clear trap help

reset chassis
reset help
reset module
reset remote

set acl
set arp
set chassis asset
set chassis help
set chassis name
set community
set help
set ip address
set ip help
set ip route
set logging add
set logging all
set logging delete
set logging help
set logging none
set module asset
set module autorecover
set module autorevert
set module backpressure
set module bootpdisable
set module bootpenable
set module disable
set module enable
set module fdflowctrl
set module ftpdisable
set module ftpenable
set module help
set module image
set module llcf
set module name
set module redabsel
set module redlink
set module redloa
set module redmode
set module redtx
set module sduplexAll
set module sfdflowctrlAll
set module shdflowctrlAll
set module SONAR
set module telnetdisable
set module telnetenable
set module webdisable
set module webenable
set module webredirect
set module webselect
set module write
set motd
set port autoneg
set port bandwidth
set port bert
set port burstlength
set port disable
set port dislbkres
set port duplex
set port enable
set port fault
set port fefenable
set port help
set port linebuildout
set port linecode
set port llr
set port loopback
set port name
set port remotelpbk
set port speed
set prompt
set snmp community
set snmp help
set system contact
set system help
set system location
set system name
set time
set trap control
set trap destination
set trap help
show communities
show snmp community
show snmp help

user -all
user -delete
user -help
user -set

cat
copyboot
echo
ftp
head
nvclear
password
tail
telnet
touch
tftp

### *Root Privilege*
### Login Root

clear snmp user
cp
delhost
getaddr
gethname
ifconf
mkdir
mount
mv
rm
rmdir
set snmp user
setenv
sethost
show snmp engineID
show snmp user
sync
umount

## *Guest Privilege Commands*

Guest commands are basic user commands used to monitor system status. The default password is: **guest**

**Utility Commands**

*Command:* **cd**

*Description:* Change working directory.
*Syntax:* cd <directory>
*Example:* Console>cd etc

*Command:* **chassis**

*Description:* Set the chassis scope. The command prompt displays the selected chassis, and the chassis number is no longer entered in commands which have a chassis field (e.g., 'show module 4' instead of 'show module 1 4').
*Syntax:* chassis <chassis>
*Example:* Console>chassis 1

#1>

*Command:* **clrscr**

*Description:* Clear the screen.
*Syntax:* clrscr
*Example:* Console>clrscr

*Command:* **exit**

*Description:* Log off.
*Syntax:* exit
*Example:* Console>exit

*Command:* **help**

*Description:* Show available commands.

*Syntax:* help
?

*Note:* Using 'help' with another command (e.g., 'help ping') will display a description of the command followed by the following system message <reentrant, not locked> which may be disregarded.

*Example:* Console>help

| | | | | |
|---|---|---|---|---|
| cd | chassis | clrscr | exit | help |
| history | ls | module | ping | port |
| pwd | pwv | quit | remote | remoteport |
| show | top | up | | |

*Command:* **history**

*Description:* List all commands that have been entered, or repeat a prior command.

*Syntax:* history, !!, !#

*Note:* History lists all commands that have been entered.
!! repeats the last command.
!# repeats the #th command in the history list (e.g., !4 repeats the 4th command entered).

*Example:* Console>history

```
1   show mod all
2   pwd
3   ls
4   show time

Console> !!

Date 5/12/2003
Time 18:09:43

Console> !2

44.0.0/
```

*Command:* **ls**

*Description:* List files.

*Syntax:* ls [-1FRdfgilqrs] [filename...]

*Options:*

| | |
|---|---|
| -1 | Display output in one column. |
| -F | Put a '/' after each directory name. |
| -R | List files recursively through subdirectories. |
| -d | List actual directory, not contents. |
| -f | Do not sort output. |
| -g | Show group ownership of a file. |
| -i | Print a file's associated inode. |
| -l | Long output format, show all file details. |
| -q | Show unprintables as '?'. |
| -r | Reverse the sort order. |
| -s | Show a file's size. |

*Example:*

```
Console>ls -l

total 4
-rwxrwxrwx  1 root      318 May 12 2003 05:50 acl
-rwxrwxrwx  1 root      656 May 12 2003 05:50 hosts
-rwxrwxrwx  1 root      204 May 12 2003 05:50 motd
-rwxrwxrwx  1 root      151 May 12 2003 05:50 passwd
```

*Command:* **module**

*Description:* Set the module scope. The command prompt displays the selected chassis and module. The chassis and module numbers are no longer entered in commands which have these fields (e.g., 'show port 2' instead of 'show port 1 11 2').

*Syntax:* module <chassis> <module[-converter]>

*Example:*

```
Console>module 1 11

#1/11>
```

*Command:* **ping**

*Description:* Send ICMP echo request packets to the network host.

*Syntax:* ping [-s] <host> [timeout]

*Note:* When the -s option is specified, ping sends one datagram per second and prints one line of output for every response it receives. The default timeout is 10.

*Example:*

```
Console>ping 100.132.65.99

ping (100.132.65.99): 56 data bytes
100.132.65.99 is alive
```

*Command:* **port**

*Description:* Set the port scope. The command prompt displays the selected chassis, module and port. The chassis, module and port numbers are no longer entered in commands which have these fields (e.g., 'show port' instead of 'show port 1 11 2').

*Syntax:* port <chassis> <module[-converter]> <port>

*Example:*

```
Console>port 1 11 2

#1/11/2>
```

*Command:* **pwd**

*Description:* Print working directory.

*Syntax:* pwd

*Example:*

```
Console>pwd

44.0.0/
```

*Command:* **pwv**

*Description:* Print working volume.

*Syntax:* pwv

*Example:*

```
Console>pwv

44.0.0
```

*Command:* **quit**

*Description:* Log off.
*Syntax:* quit
*Example:* Console>quit

*Command:* **remote**

*Description:* Set the remote scope. The command prompt displays the selected chassis, module, port and remote card. The chassis, module, port and remote card numbers are no longer entered in commands which have these fields (e.g., 'show module' instead of 'show module 1 11 2 1').
*Syntax:* remote <chassis> <module> <port> <remote>
*Example:* Console>remote 1 11 2 1

#1/11/2/1>

*Command:* **remoteport**

*Description:* Set the remote port scope. The command prompt displays the selected chassis, module, port, remote card and remote port. The chassis, module, port, remote card and remote port numbers are no longer entered in commands which have these fields (e.g., 'show port' instead of 'show port 1 11 2 1 2').
*Syntax:* remoteport <chassis> <module> <port> <remote> <remoteport>
*Example:* Console>remoteport 1 11 2 1 2

#1/11/2/1/2>

*Command:* **top**

*Description:* Reset the scope so nothing is specified.
*Syntax:* top
*Example:* #1/11/2/1/2>top

Console>

*Command:* **up**

*Description:* Set the scope up one or more levels.

*Syntax:* up

up <level>

*Note:* If no level is specified, the scope will move up one level.

*Example:*

```
#1/11/2/1/2>up

#1/11/2/1>up 3

#1>
```

**Show Commands**

*Command:* **show acl**

*Description:* Show entries in the Access Control List (ACL) which allows a user to limit the end stations (IP addresses) that communicate with the chassis.

*Note:* Protocols/services effected: FTP, TELNET, SNMP.

*Syntax:* show acl

*Example:*

```
Console>show acl

Current ACL entries:

Ip Address          Validation Mask
_______________     _______________
100.132.065.099     255.255.255.255
100.132.065.023     255.255.255.255
```

*Command:* **show arp**

*Description:* Show the Address Resolution Protocol table.

*Syntax:* show arp

*Example:*

```
Console>show arp

IP Addr             Mac addr
_____________       ___________________
100.132.65.99       0:10:9f:c7:43:20
100.132.65.174      0:10:9f:85:c3:a9
100.132.65.176      0:10:9f:85:ab:6a
```

*Command:* **show chassis**

*Description:* Show details for a chassis, including its power supply unit(s). If the chassis has multiple cards with temperature sensors, the cards with the highest and lowest readings are displayed, along with the average temperature among all the sensors in the chassis. An access line card displays the actual temperature of the board, not the air, and it may be 10 degrees higher than the management card's reading. The access line card's board temperature is functional up to 65°C.

*Syntax:* show chassis all
show chassis <chassis>

*Example #1:* Console>show chassis 2

```
Location                        : 2
Number of I/O Slots             : 17
Number of P/S Slots             : 2
Serial Number                   : B0003900566
Manufacture Date                : 12/21/2002
HW Revision                     : A
Asset ID                        :
Name                            : Chassis2
Description                     : 17 Slot Chassis 19"
Part Number                     : R5000-17HS
Uptime                          : 4 days 00:19:47.35
Average Temperature             : 111F ( 44C)
Module1_17 (Maximum)            :  195F ( 91C)
Module1_14 (Minimum)            :   80F ( 27C)

Power Supply 2 1                : AC       PS_A On   Power Supply
5 Volt (Millivolts): Current: 5275   Min: 5000  Max: 5500 (IN RANGE)
Power Supply 2 2                : AC       PS_B Off  Power Supply
5 Volt (Millivolts): Current: 0      Min: 5000  Max: 5500 (OUT OF RANGE)
```

*Example #2:* Console>show chassis all

| Location | I/O Slots | P/S Slots | Name | Description |
|---|---|---|---|---|
| 1 | 17 | 2 | Chassis1 | 17 Slot Chassis 19" |
| 2 | 17 | 2 | Chassis2 | 17 Slot Chassis 19" |

*Command:* **show help**

*Description:* Show the 'show' commands with a brief description.
*Syntax:* show help
show ?
*Example:* Console>show ?

| Command | Description |
|---|---|
| acl | : Show Access Control List |
| arp | : Show ARP Tables |
| chassis | : Show chassis information |
| help | : Show this message |
| interface | : Show network interfaces |
| ip | : Show IP; use 'show ip help' for more info |
| log | : Show log; use 'show log help' for more info |
| mac | : Show MAC Information |
| module | : Show module information |
| motd | : Show Message of the Day |
| netstat | : Show netstat; use 'show netstat help' for more info |
| port | : Show port information |
| stats | : Show port statistics |
| system | : Show system information |
| time | : Show time of day |
| trap | : Show Trap Information |

*Command:* **show interface**

*Description:* Show network interfaces.
*Syntax:* show interface
*Example:* Console>show interface

IP Interfaces

| if# | mtu | Interface Addr | Subnet Mask | Broadcast Addr |
|---|---|---|---|---|
| 1 | 1500 | 100.132.060.161 | 255.255.255.000 | 100.132.060.255 |
| 2 | 1500 | 100.132.061.161 | 255.255.255.000 | 100.132.061.255 |
| 3 | 1536 | 127.000.000.001 | 255.000.000.000 | 127.000.000.000 |

*Command:* **show ip help**

*Description:* Show 'show ip' subcommands.
*Syntax:* show ip help
*Example:* Console>show ip help

| Command | Description |
|---|---|
| help | : Show this message |
| routes | : Show IP routes |
| stats | : Show IP statistics |

*Command:* **show ip routes**

*Description:* Show established routes.
*Syntax:* show ip routes
*Example:* Console>show ip routes

| Destination | Gateway | Mask | Flags | Interface |
|---|---|---|---|---|
| default | 100.132.65.1 | 0.0.0.0 | U | 1 |
| 127.0.0.1 | 127.0.0.1 | 0.0.0.0 | U | 2 |
| 100.132.65.0 | 100.132.65.98 | 255.255.255.0 | U | 1 |

*Command:* **show ip stats**

*Description:* Show MIB II IP statistics.
*Syntax:* show ip stats
*Example:* Console>show ip stats

| IP Statistics | |
|---|---|
| forwarding | 1 |
| defaultttl | 64 |
| inreceives | 583 |
| inhderrors | 0 |
| inaddrerrors | 0 |
| forward datagrams | 0 |
| unknown protos | 0 |
| indiscards | 0 |
| indelivers | 583 |
| outrequests | 633 |
| outdiscards | 0 |

```
outnoroutes          0
reasmtimeout         30
reasmreqds           0
reasmfails           0
fragoks              0
fragfails            0
fragcreates          0
routingdiscards      0
```

*Command:* **show log all**

*Description:* Show all available logs.

*Syntax:* show log all

*Example:* Console>show log all

```
Event Logs:
———————

Index          :1
Name           :'Non-Volatile'
Severities     :PROCESSOR FATAL SEVERE ERROR WARNING
Entries        :23
Log Size       :3984
Free mem       :1900
Seq range      :1 to 23

Index          :2
Name           :'Volatile'
Severities     :PROCESSOR FATAL SEVERE ERROR
                WARNING  INFO PRINT TRAP EVMGR
Entries        :86
Log Size       :65424
Free mem       :58540
Seq range      :1 to 86

Index          :3
Name           :'Trap'
Severities     :TRAP
Entries        :21
Log Size       :8080
Free mem       :6256
Seq range      :1 to 21
```

*Command:* **show log details**

*Description:* Show details of desired log records.

*Syntax:* show log details <log index> [min sequence #] [max sequence #]

*Notes:* If no sequence numbers are provided the entire log will be shown. If no maximum sequence number is provided the log will be shown to the end.

*Example:*

```
Console>show log details 1 15 17

Log: Non-Volatile
-------------------------------------------------
Seq Number      : 15
Error Number    : 7
Error Text      : Incorrect Object type
Group Text      : pSOS+
Message         : test message
Task            : psc0
Date            : 5/18/2003
Time            : 0:03:48
Ticks           : 84
Uptime          : 23183
Severity        : PROCESSOR
-------------------------------------------------
Seq Number      : 16
Error Number    : 8
Error Text      : Node's Object table full
Group Text      : pSOS+
Message         : test message
Task            : psc0
Date            : 5/18/2003
Time            : 0:03:48
Ticks           : 85
Uptime          : 23184
Severity        : PROCESSOR
-------------------------------------------------
Seq Number      : 17
Error Number    : 9
Error Text      : Named Object not found
Group Text      : pSOS+
Message         : test message
Task            : psc0
Date            : 5/18/2003
Time            : 0:03:48
Ticks           : 86
Uptime          : 23185
Severity        : PROCESSOR
```

*Command:* **show log help**

*Description:* Show the ‘show log’ subcommands.

*Syntax:* show log help

*Example:* Console>show log help

```
Command     Description
_____________________________________

all         : Show all logs
details     : Show log record details
help        : Show this message
severities  : Show messages severities
summary     : Show log record summary
tail        : Show end of log
```

*Command:* **show log severities**

*Description:* Show the different message severities used for log messages; also indicate which of them are sent to the console.

*Syntax:* show log severities

*Note:* This command is useful in conjunction with the ‘set logging’ command.

*Example:* Console>show log severities

```
The following message severities are available.
'*' indicates severities that are sent to the console.

FAULT *
FATAL *
SEVERE *
ERROR *
WARNING *
INFO *
PRINT *
DEBUG *
TRAP *
EVENT_MGR *
```

*Command:* **show log summary**

*Description:* Show a one-line description of log records.
*Syntax:* show log summary <log index> [min seq #] [max seq #]
*Example:* Console>show log summary 2 25 30

Log: Volatile

ROOT :00000000:INFO (Dnsd daemon initialized)
ROOT :00000000:INFO (Httpd daemon initialized)
ROOT :00000000:INFO (HTTP daemon enabled)
CMGR :00000000:INFO (R502-M Inserted in IoSlot1_17)
CMGR :00000000:INFO (R621-11 Inserted in IoSlot1_2)
CMGR :00000000:INFO (R131-15 Inserted in IoSlot1_11)

*Command:* **show log tail**

*Description:* Show a summary of the most recent records in a log.
*Syntax:* show log tail <log index> [# records]
*Note:* Defaults to 10.
*Example:* Console>show log tail 2

Log: Volatile

MAGT:00000000:TRAP (TDM Remote Fault Alarm: Name=Port14_2)
sh01 :00000000:INFO (User <Administrator> logged in)
sh02 :00000000:INFO (User <Guest> logged in)
sh03 :00000000:INFO (User <Administrator> logged in)
sh04 :00000000:INFO (User <Super User> logged in)
sh05 :00000000:INFO (User <Super User> logged in)
sh06 :00000000:INFO (User <Administrator> logged in)
sh07 :00000000:INFO (User <Super User> logged in)
sh08 :00000000:INFO (User <Guest> logged in)
sh09 :00000000:INFO (User <Super User> logged in)

*Command:* **show mac**

*Description:* Show MAC information.
*Syntax:* show mac
*Example:* Console>show mac

| Int # | IP address | Mac |
|---|---|---|
| 1 | 100.132.65.248 | 0:10:9f:18:4:7a |
| 2 | 100.168.0.1 | 0:10:9f:18:4:7b |
| 3 | 127.0.0.1 | 0:0:0:0:0:0 |

*Command:* **show module**

*Description:* Show module information.

*Syntax:* show module all [chassis]
show module <chassis> <module[-converter]>
show module <chassis> <module> <port> <remote>

*Note:* Specifying an individual module shows all its details.

*Example #1:* Console>show module all

| Location | State | Type | Name | Desc | #ports |
|---|---|---|---|---|---|
| 1/3 | Enabled | Single | Module1_3 | 10M TP to BNC | 2 |
| 1/4 | Enabled | Access | Module1_4 | 100M TX to FX SM/SC S/IP | 2 |
| 1/4/2/1 | Enabled | Access | Module1_4_2_1 | 100M TX to FX SM/SC S/IP | 2 |
| 1/5 | Enabled | Access | Module1_5 | 100M TX to FX SM/SC S/IP | 2 |
| 1/7 | Enabled | Access | Module1_7 | 100M TX to FX SM/SC S/IP | 2 |
| 1/8 | Enabled | Access | Module1_8 | 100M TX to FX SM/SC S/IP | 2 |
| 1/10 | Enabled | Single | Module1_10 | 10M TP to FL MM/ST | 2 |
| 1/11 | Enabled | Single | Module1_11 | 10M TP to FL/MM/ST | 2 |
| 1/16 | Enabled | Gigabit | Module1_16 | 1000M TX to LX SM/SC | 2 |
| 1/17 | Enabled | Management | Module1_17 | 10M Dual TP Management | 3 |
| 2/2 | Enabled | Management | Module2_2 | 10M TP Management | 2 |

*Example #2:* Display details for a Gigabit line card.
Console>show module 1 16

| | |
|---|---|
| Location | : 1/16 |
| Name | : Module1_16 |
| Type | : Gigabit |
| Asset ID | : |
| Description | : 1000M TX to LX SM/SC |
| Hardware Revision | : A |
| Part Number | : R152-1D |
| Serial Number | : 20115 |
| Manufacturing Date | : 05/07/2003 |
| Module State Oper | : Enabled |

```
Diagnostic Status              : Good
Number of ports                : 2
Number of slots                : 1
Uptime                         : 4 days 00:23:07.15
Link Loss Carry Forward Oper : Disabled
```

*Note:* When the administrative and operational settings for a function do not agree, both settings are displayed. The administrative and operational settings could differ because the switch is not applicable in a particular mode or because the switch was changed but has not yet taken effect.

*Command:* **show motd**

*Description:* Show the message of the day displayed at login.
*Syntax:* show motd
*Example:* Console>show motd

```
This is the message of the day
```

*Command:* **show netstat active**

*Description:* Show active socket connections.
*Syntax:* show netstat active
*Example:* Console>show netstat active

| Proto | Local Address | Foreign Address | (state) |
|---|---|---|---|
| udp | 0.0.0.0.161 | | |
| udp | 0.0.0.0.3052 | | |
| tcp | 0.0.0.0.21 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.23 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.80 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.705 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.1024 | 0.0.0.0.0 | LISTEN |
| tcp | 100.132.35.163.23 | 100.132.65.143.2352 | ESTABLISHED |
| tcp | 100.132.35.163.1024 | 100.132.35.163.1038 | ESTABLISHED |
| tcp | 100.132.35.163.1038 | 100.132.35.163.1024 | ESTABLISHED |

*Command:* **show netstat all**

*Description:* Show all network status information.
*Syntax:* show netstat all
*Example:* Console>show netstat all

| Proto | Local Address | Foreign Address | (state) |
|---|---|---|---|
| udp | 0.0.0.0.161 | | |
| udp | 0.0.0.0.3052 | | |
| tcp | 0.0.0.0.21 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.23 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.80 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.705 | 0.0.0.0.0 | LISTEN |
| tcp | 0.0.0.0.1024 | 0.0.0.0.0 | LISTEN |
| tcp | 100.132.35.163.23 | 100.132.65.143.2352 | ESTABLISHED |
| tcp | 100.132.35.163.1024 | 100.132.35.163.1038 | ESTABLISHED |
| tcp | 100.132.35.163.1038 | 100.132.35.163.1024 | ESTABLISHED |

| I/F | Mtu | Address | Ipkts | Ierrs | Opkts | Oerrs | Queue |
|---|---|---|---|---|---|---|---|
| 1 | 1500 | 100.132.35.163 | 273148 | 0 | 358 | 0 | 0 |
| 6 | 1536 | 127.0.0.1 | 2198 | 0 | 2198 | 0 | 0 |

| Destination | Gateway | Mask | Flags | Interface |
|---|---|---|---|---|
| default | 100.132.35.1 | 0.0.0.0 | UG | 1 |
| 127.0.0.1 | 127.0.0.1 | 0.0.0.0 | U | 2 |
| 100.132.35.0 | 100.132.35.163 | 255.255.255.0 | U | 1 |

udp:
657 datagrams delivered to users
36 datagrams received for unknown ports
0 datagrams received with other errors
257 datagrams sent
tcp:
24 segments sent
0 segments retransmitted
0 segments sent with RST flag
26 segments received
0 segments received in error
0 failed TCP connection attempts
0 TCP connections reset

ip:

877 received from interfaces
0 drops due to format errors
0 drops due to invalid addresses
0 IP datagrams forwarded
6 IP datagrams discarded due to unknown protocol
0 input datagrams discarded with no problems
871 datagrams delivered to IP user protocols
468 datagrams supplied by IP user protocols
0 outbound datagrams discarded
0 IP datagrams dropped due to no routes
0 IP fragments needing reassembly
0 IP fragments reassembled
0 IP fragments reassembly failures
0 IP datagrams successfully fragmented
0 IP datagrams fragmentation failures
0 IP fragments created
0 IP routing entities discarded

icmp:

| | Received | Sent |
|---|---|---|
| Messages | 157 | 187 |
| Errors | 0 | 0 |
| Destination Unreachable | 6 | 36 |
| Time Exceeded | 0 | 0 |
| Parameter Problems | 0 | 0 |
| Source Quenches | 0 | 0 |
| Redirects | 0 | 0 |
| Echos | 151 | 0 |
| Echo Replies | 0 | 151 |
| Timestamps | 0 | 0 |
| Timestamps Replies | 0 | 0 |
| Address Mask Requests | 0 | 0 |
| Address Mask Replies | 0 | 0 |

snmp:

| | |
|---|---|
| In Packets | 158 |
| Out Packets | 347 |
| In Bad Versions | 0 |
| In Bad Comm. Names | 0 |
| In Bad Comm Uses | 0 |

| | |
|---|---|
| In ASN Parse Errors | 0 |
| In Too Bigs | 0 |
| In No Such Names | 0 |
| In Bad Values | 0 |
| In Read Onlys | 0 |
| In Gen Errors | 0 |
| In Total Req. Vars | 289 |
| In Total Set Vars | 23 |
| In Get Requests | 880 |
| In Get Nexts | 232 |
| In Set Requests | 20 |
| In Get Responses | 0 |
| In Traps | 0 |
| Out Too Bigs | 0 |
| Out No Such Names | 8 |
| Out Bad Values | 0 |
| Out Gen Errors | 0 |
| Out Get Requests | 0 |
| Out Get Nexts | 0 |
| Out Set Requests | 0 |
| Out Get Responses | 157 |
| Out Traps | 190 |
| Out Silent Drops | 0 |
| Out Proxy Drops | 0 |

*Command:* **show netstat help**

*Description:* Show the ‘show netstat’ subcommands.

*Syntax:* show netstat help

*Example:* Console>show netstat help

| Command | Description |
|---|---|
| active | : Show netstat active |
| all | : Show netstat all |
| help | : Show this message |
| interface | : Show netstat interface |
| routes | : Show netstat routes |
| snmp | : Show netstat snmp |
| statistics | : Show netstat statistics |

*Command:* **show netstat interface**

*Description:* Show network interface statistics.
*Syntax:* show netstat interface
*Example:* Console>show netstat interface

| I/F | Mtu | Address | Ipkts | Ierrs | Opkts | Oerrs | Queue |
|---|---|---|---|---|---|---|---|
| 1 | 1500 | 100.132.65.153 | 358 | 0 | 271 | 0 | 50 |
| 2 | 1500 | 100.168.0.1 | 0 | 0 | 0 | 0 | 50 |
| 3 | 1536 | 127.0.0.1 | 190 | 0 | 190 | 0 | 0 |

*Command:* **show netstat routes**

*Description:* Show IP routes.
*Syntax:* show netstat routes
*Example:* Console>show netstat routes

| Destination | Gateway | Mask | Flags | Interface |
|---|---|---|---|---|
| default | 100.132.35.1 | 0.0.0.0 | UG | 1 |
| 127.0.0.1 | 127.0.0.1 | 0.0.0.0 | U | 2 |
| 100.132.35.0 | 100.132.35.163 | 255.255.255.0 | U | 1 |

*Command:* **show netstat snmp**

*Description:* Show SNMP statistics.
*Syntax:* show netstat snmp
*Example:* Console>show netstat snmp

snmp:

| | |
|---|---|
| In Packets | 21 |
| Out Packets | 245 |
| In Bad Versions | 0 |
| In Bad Comm. Names | 0 |
| In Bad Comm Uses | 0 |
| In ASN Parse Errors | 0 |
| In Too Bigs | 0 |
| In No Such Names | 0 |
| In Bad Values | 0 |
| In Read Onlys | 0 |
| In Gen Errors | 0 |
| In Total Req. Vars | 236 |

| | |
|---|---|
| In Total Set Vars | 0 |
| In Get Requests | 0 |
| In Get Nexts | 21 |
| In Set Requests | 0 |
| In Get Responses | 0 |
| In Traps | 0 |
| Out Too Bigs | 0 |
| Out No Such Names | 8 |
| Out Bad Values | 0 |
| Out Gen Errors | 0 |
| Out Get Requests | 0 |
| Out Get Nexts | 0 |
| Out Set Requests | 0 |
| Out Get Responses | 20 |
| Out Traps | 225 |
| Out Silent Drops | 0 |
| Out Proxy Drops | 0 |

*Command:* **show netstat statistics**

*Description:* Show network statistics.

*Syntax:* show netstat statistics

*Example:* Console>show netstat statistics

```
udp:
    105 220 datagrams delivered to users
    2 datagrams received for unknown ports
    0 datagrams received with other errors
    93 datagrams sent
tcp:
    152 segments sent
    1 segments retransmitted
    0 segments sent with RST flag
    474 segments received
    0 segments received in error
    0 failed TCP connection attempts
    14 TCP connections reset
ip:
    271 received from interfaces
    0 drops due to format errors
    294 drops due to invalid addresses
```

0 IP datagrams forwarded
0 IP datagrams discarded due to unknown protocol
0 input datagrams discarded with no problems
977 datagrams delivered to IP user protocols
528 datagrams supplied by IP user protocols
0 outbound datagrams discarded
0 IP datagrams dropped due to no routes
0 IP fragments needing reassembly
0 IP fragments reassembled
0 IP fragments reassembly failures
0 IP datagrams successfully fragmented
0 IP datagrams fragmentation failures
0 IP fragments created
0 IP routing entities discarded

icmp:

| | Received | Sent |
|---|---|---|
| Messages | 279 | 280 |
| Errors | 0 | 0 |
| Destination Unreachable | 6 | 36 |
| Time Exceeded | 0 | 0 |
| Parameter Problems | 0 | 0 |
| Source Quenches | 0 | 0 |
| Redirects | 0 | 0 |
| Echos | 178 | 0 |
| Echo Replies | 0 | 278 |
| Timestamps | 0 | 0 |
| Timestamps Replies | 0 | 0 |
| Address Mask Requests | 0 | 0 |
| Address Mask Replies | 0 | 0 |

snmp:

| | |
|---|---|
| In Packets | 158 |
| Out Packets | 347 |
| In Bad Versions | 0 |
| In Bad Comm. Names | 0 |
| In Bad Comm Uses | 0 |
| In ASN Parse Errors | 0 |
| In Too Bigs | 0 |
| In No Such Names | 0 |
| In Bad Values | 0 |
| In Read Onlys | 0 |

| | |
|---|---|
| In Gen Errors | 0 |
| In Total Req. Vars | 289 |
| In Total Set Vars | 23 |
| In Get Requests | 880 |
| In Get Nexts | 232 |
| In Set Requests | 20 |
| In Get Responses | 0 |
| In Traps | 0 |
| Out Too Bigs | 0 |
| Out No Such Names | 8 |
| Out Bad Values | 0 |
| Out Gen Errors | 0 |
| Out Get Requests | 0 |
| Out Get Nexts | 0 |
| Out Set Requests | 0 |
| Out Get Responses | 157 |
| Out Traps | 190 |
| Out Silent Drops | 0 |
| Out Proxy Drops | 0 |

*Command:* **show port**

*Description:* Show port information.

*Syntax:* show port all
show port <chassis> <module[-converter]> [port]
show port <chassis> <module> <port> <remote> [remoteport]

*Example #1:* Console>show port all

| Location | Name | Status | Duplex | Speed | Type | ANeg | LLR | Activity | Connector |
|---|---|---|---|---|---|---|---|---|---|
| 1/2/3 | Port1_2_3 | No Link | Full | 100Mb | e100BaseFX_MM | n/a | n/a | Active | SC |
| 1/3/1 | Port1_3_1 | Link | Half | 100Mb | e100BaseTX | Disabled | n/a | Active | RJ45 |
| 1/3/2 | Port1_3_2 | Link | Half | 100Mb | e100BaseFX_MM | n/a | Enabled | Active | SC |
| 1/3/2/1/1 | Port1_3_2_1_1 | No Link | Half | 100Mb | e100BaseTX | Disabled | n/a | Active | RJ45 |
| 1/3/2/1/2 | Port1_3_2_1_2 | Link | Half | 100Mb | e100BaseFX_MM | n/a | Enabled | Active | SC |
| 1/17/1 | Port1_17_1 | Link | Half | 10Mb | e10BaseT | n/a | n/a | Active | RJ45 |
| 2/11/1 | Port2_11_1 | No Link | Full | 10Mb | e10BaseT | Disabled | n/a | Active | RJ45 |
| 2/11/2 | Port2_11_2 | No Link | Full | 10Mb | e10BaseFL_MM | n/a | Disabled | Active | ST |
| 2/15/1 | Port2_15_1 | Link | Full | 10Mb | e10BaseT | Disabled | n/a | Active | RJ45 |
| 2/15/2 | Port2_15_2 | No Link | Full | 10Mb | e10BaseFL_MM | n/a | Enabled | Active | ST |
| 2/17/1 | Port2_17_1 | Link | Half | 10Mb | e10BaseT | n/a | n/a | Active | RJ45 |

| Location | Name | Speed | DataBits | Parity | StopBits | FlowControl | Connector |
|---|---|---|---|---|---|---|---|
| 1/17/2 | Port1_17_2 | 9600 | Eight | None | One | None | DB9 |
| 2/17/2 | Port2_17_2 | 9600 | Eight | None | One | None | DB9 |

*Example #2:* Console>show port 1 3

| Location | Name | Status | Duplex | Speed | Type | ANeg | LLR | Activity | Connector |
|---|---|---|---|---|---|---|---|---|---|
| 1/3/1 | Port1_3_1 | Link | Half | 100Mb | e100BaseTX | Disabled | n/a | Active | RJ45 |
| 1/3/2 | Port1_3_2 | Link | Half | 100Mb | e100BaseFX_MM | n/a | Enabled | Active | SC |

*Example #3:* Show port information for a remote access line card's copper port.

Console>show port 1 3 2 1 1

| | |
|---|---|
| Location | : 1/3/2/1/1 |
| Name | : Port1_3_2_1_1 |
| Port Type | : e100BaseTX |
| Connector Type | : RJ45 |
| Distance | : n/a |
| Uptime | : 2 days 03:08:45.55 |
| Link Status | : Link |
| Activity | : Active |
| Port State Oper | : Enabled |
| Autonegotiation Oper | : Disabled |
| Port Speed Oper | : 100Mb |
| Port Duplex Oper | : Full |
| Rx Burst Length Oper | : 16 |
| Tx Burst Length Oper | : 16 |
| Provisioned Rx Bandwidth Oper | : 38 |
| Provisioned Tx Bandwidth Oper | : 62 |
| Rx Blocked Packets | : 2 301 780 081 |
| Tx Blocked Packets | : 2 301 780 081 |
| Rx Blocked Octets | : 1 284 245 646 |
| Tx Blocked Octets | : 1 284 245 646 |
| HW (External Toggle) CrossOver Switch | : Cross Over |

*Command:* **show stats rmon**

*Description:* Show RMON port statistics for an access line card.

*Syntax:* show stats rmon <chassis> <module> <port> [<remote> <remoteport>]

*Example:* Console>show stats rmon 1 10 1

| | |
|---|---|
| Owner | : Port1_1_1 |
| EtherStatsOctets | :1 080 586 547 |
| EtherStatsPkts | :6 709 553 |
| EtherStatsBroadcastPkts | :1 182 884 |
| EtherStatsMulticastPkts | :34 |
| EtherStatsCRCAlignErrors | :372 |
| EtherStatsUndersizePkts | :958 |
| EtherStatsOversizePkts | :0 |
| EtherStatsFragments | :958 |
| EtherStatsJabbers | :0 |
| EtherStatsCollisions | :0 |
| EtherStatsPkts64Octets | :2 785 393 |
| EtherStatsPkts65to127Octets | :2 477 697 |
| EtherStatsPkts128to255Octets | :568 816 |
| EtherStatsPkts256to511Octets | :547 964 |
| EtherStatsPkts512to1023Octets | :112 493 |
| EtherStatsPkts1024to1518Octets | :216 232 |
| Dropped Events | :0 |

*Command:* **show system**

*Description:* Show information about the management system.

*Syntax:* show system

*Example:* Console>show system

System Information.

| | |
|---|---|
| Name | : Marketing Department |
| Description | : 17 Slot Chassis 19" |
| Contact | : C. Smith x205 |
| Location | : Merrimack Office |
| Uptime | : 3 days 6:57:17 |

*Command:* **show time**

*Description:* Show date and time of day.
*Syntax:* show time
*Example:* Console>show time

Date 5/20/2003
Time 16:06:28

*Command:* **show trap controls**

*Description:* Show trap control information.
*Syntax:* show trap controls
*Example:* Console>show trap controls

| | Trap Name | Status | V2 Trap Oid |
|---|---|---|---|
| 1 | Generic Cold Start | Enabled | 1.3.6.1.6.3.1.1.5.1 |
| 2 | Generic Warm Start | Enabled | 1.3.6.1.6.3.1.1.5.2 |
| 3 | Generic Link Down | Enabled | 1.3.6.1.6.3.1.1.5.3 |
| 4 | Generic Link Up | Enabled | 1.3.6.1.6.3.1.1.5.4 |
| 5 | Generic Authentication Failure | Enabled | 1.3.6.1.6.3.1.1.5.5 |
| 6 | Generic EGP Neighbor Loss | Not Applic | 1.3.6.1.6.3.1.1.5.6 |
| 7 | Entity Configuration Change | Enabled | 1.3.6.1.2.1.47.2.0.1 |
| 8 | Entity Insert | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.1 |
| 9 | Entity Remove | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.2 |
| 10 | Entity Reset | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.3 |
| 11 | Power Supply Status Change | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.4 |
| 12 | Ethernet Port Link Status Change | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.5 |
| 13 | Sonet Port Link Status Change | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.6 |
| 14 | Sensor Threshold | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.7 |
| 15 | Redundant Switch Over | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.8 |
| 16 | Ethernet Remote Fault Alarm | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.9 |
| 17 | Ethernet Port Speed Change | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.10 |
| 18 | TDM Port Link Status Change | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.11 |
| 19 | TDM Remote Fault Alarm | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.12 |
| 20 | Enet Port Far End Fault Alarm | Enabled | 1.3.6.1.4.1.2745.11.3.2.0.13 |

*Command:* **show trap destination**

*Description:* Show trap destination information.
*Syntax:* show trap destination
*Example:* Console>show trap destination

| IP Address | Udp Port | Status | Name | Snmp Version |
|---|---|---|---|---|
| 100.132.60.194 | 9162 | Active | NetBeacon 100.132.60.8 | V1 |
| 100.132.60.197 | 9162 | Active | NetBeacon 100.132.60.12 | V2 |

*Command:* **show trap help**

*Description:* Display the 'show trap' subcommands.
*Syntax:* show trap help
*Example:* Console>show trap help

| Command | Description |
|---|---|
| destination | : Show Trap Destination |
| controls | : Show Trap Controls |
| help | : Show this message |

## *Admin Privilege Commands*

Administrative level commands allow a system administrator to configure and monitor the system. The default password is: **admin**

**Bootp Commands**

*Command:* **bootp -all**

*Description:* Display the MAC and IP addresses configured for the chassis in the stack.
*Syntax:* bootp -all
*Note:* Not applicable to the x501-M.
*Example:* Console>bootp -all
0x00409f180565 172.31.3.1
0x00409f180a39 172.31.2.1

*Command:* **bootp -delete**

*Description:* Delete an IP address from the stack.

*Syntax:* bootp -delete <MAC address>

*Note:* Not applicable to the x501-M.

*Example:*

```
Console>bootp -delete 0x00409f180a39

Console>
```

*Command:* **bootp -help**

*Description:* Display 'bootp' subcommands.

*Syntax:* bootp -help

*Example:*

```
Console>bootp -help

Usage:  bootp
        -all                        Display contents of BOOTP
        -delete <macaddr>           Delete IP address from BOOTP
        -help                       usage
        -set <macaddr> <ipadd>      Add IP address to BOOTP
```

*Command:* **bootp -set**

*Description:* Add an IP address to the stack.

*Syntax:* bootp -set <MAC address> <IP address>

*Note:* Not applicable to the x501-M.
When assigning an IP address to a chassis, the following format is required:

1. The first two numbers must match the first two numbers of the primary chassis' secondary interface IP address.
2. The third number must be the chassis position in the stack.
3. The fourth number must be the slot number where the management card is installed.

*Example:* The IP address of the primary chassis' secondary interface is 172.31.1.17. To configure chassis 2, which has a management card in slot 17, enter the following command.

```
Console>bootp -set 0x00409f180a39 172.31.2.1

Console>
```

**Clear Commands**

*Command:* **clear acl**

*Description:* Clear a specific entry or all entries from the Access Control List table.

*Syntax:* clear acl <IP address>
clear acl all

*Example:*

```
Console>clear acl all

access control list cleared
```

*Command:* **clear arp**

*Description:* Delete one or all ARP entries.

*Syntax:* clear arp <IP address>
clear arp all

*Example:*

```
Console>clear arp all

Clearing arp table
IP Addr            Mac addr
_____________________________________

100.132.65.99      (100.132.65.99) deleted
```

*Command:* **clear help**

*Description:* Display the 'clear' subcommands.

*Syntax:* clear help

*Example:*

```
Console>clear help

Command  Description
_____________________________________

acl      : Clear ACL entry
arp      : Clear ARP table entries
help     : Show this message
ip       : Clear IP; use 'clear ip help' for more information
log      : Clear log information
motd     : Clear Message of the Day
snmp     : Clear snmp; use 'clear snmp help' for more info
trap     : Clear trap; user 'clear trap help' for more info
```

*Command:* **clear ip help**

*Description:* Display the 'clear ip' subcommands.
*Syntax:* clear ip help
*Example:* Console>clear ip help

```
Command     Description
------------------------------------
route       : Clear IP routing table entries
help        : Show this message
```

*Command:* **clear ip route**

*Description:* Clear an IP route.
*Syntax:* clear ip route <destination IP> <gateway> <mask>
clear ip route default <gateway> <mask>
*Example:* Clear the default IP route.

```
Console>clear ip route default 100.132.65.98 0.0.0.0

Ok.
```

*Command:* **clear log**

*Description:* Clear one of the event logs.
*Syntax:* clear log <log_index>
*Example:* Console>clear log 2

```
Clearing Log: Volatile
```

*Command:* **clear motd**

*Description:* Clear the message of the day.
*Syntax:* clear motd
*Example:* Console>clear motd

```
Ok. motd cleared
```

*Command:* **clear snmp community**

*Description:* Clear the SNMP community string. Disable the get or set community string access.

*Syntax:* clear snmp community <get | set>

*Example:* Console>clear snmp community get

WARNING - This will disable SNMPv1/v2c read-only protection

Disable read-only protection? [Y/N]y

Ok.

*Command:* **clear snmp help**

*Description:* Show 'clear snmp' subcommands.

*Syntax:* clear snmp help

*Example:* Console>clear snmp help

| Command | Description |
|---|---|
| community | : Clear SNMP Community String (disable get/ set community string SNMP access) |
| help | : Show this message |

*Command:* **clear trap destination**

*Description:* Clear one entry or all entries in the Trap Destination/ Manager table.

*Syntax:* clear trap destination <IP address> <UDP port>
clear trap destination all

*Example:* Console>clear trap destination all

Trap Destination table cleared

*Command:* **clear trap help**

*Description:* Show ‘clear trap’ subcommands.
*Syntax:* clear trap help
*Example:* Console>clear trap help

```
Command      Description
_____________________________________

destination  : Clear Trap Destination/Manager Table
help         : Show this message
```

**Reset Commands**

*Command:* **reset chassis**

*Description:* Reset one chassis or all chassis in the stack.
*Syntax:* reset chassis <chassis> [default]
reset chassis all [default]
*Example:* Console>reset chassis all

Ok.

*Command:* **reset help**

*Description:* Display the ‘reset’ subcommands.
*Syntax:* reset help
*Example:* Console>reset help

```
Command      Description
_____________________________________

chassis      : Reset chassis
help         : Show this message
module       : Reset module
remote       : Reset remote
```

*Command:* **reset module**

*Description:* Reset a module.
*Syntax:* reset module <chassis> <module> [default]
*Example:* Console>reset module 1 6 default

Ok.

*Command:* **reset remote**

*Description:* Reset a remote access line card.

*Syntax:* reset remote <chassis> <module> <port> <remote> [default]

*Example:*

```
Console>reset remote 1 12 2 1

Ok.
```

**Set Commands**

*Command:* **set acl**

*Description:* Set Access Control List table entry.

*Syntax:* set acl <IP address> [IP wildcard mask]

*Notes:* Entries are placed in /etc/acl.
Only devices with IPs in the table can reach the device.
If the table is empty the ACL is disabled.

*Example:*

```
Console>set acl 100.132.65.21

Access Control List entry added
```

*Command:* **set arp**

*Description:* Set ARP table entry.

*Syntax:* set arp <IP address> <hardware address>

*Example:*

```
Console>set arp 100.132.65.5 01:02:03:04:05:06

Ok.
```

*Command:* **set chassis asset**

*Description:* Set the asset tracking identifier for the chassis.

*Syntax:* set chassis asset <chassis> <asset ID>

*Note:* Multi-word strings must be placed in quotes.

*Example:*

```
Console>set chassis asset 1 66778

Chassis Asset ID successfully set.
```

*Command:* **set chassis help**

*Description:* Show ‘set chassis’ subcommands.
*Syntax:* set chassis help
*Example:* Console>set chassis help

| Command | Description |
|---|---|
| asset | : Set chassis asset ID |
| help | : Show this message |
| name | : Set chassis name |

*Command:* **set chassis name**

*Description:* Set the name of a chassis to the specified string.
*Syntax:* set chassis name <chassis> <name>
*Note:* Multi-word names must be placed in quotes. Use only alphanumeric characters for the name. Special characters, such as commas or periods, are not supported.
*Example:* Console>set chassis name 1 ChassA

Chassis Name successfully set.

*Command:* **set community**

*Description:* Set the SNMP community names.
*Syntax:* set community <get | set> [name]
*Note:* If the name is omitted, access to the community will be unprotected.
*Example:* Console>set community get public

Ok.

*Command:* **set help**

*Description:* Show ‘set’ subcommands.

*Syntax:* set <help | ?>

*Example:* Console>set help

```
                Command Description
                ———————————————————————————
acl             : Set ACL Table entry
arp             : Set ARP Table entry
chassis         : Set chassis; use ‘set chassis help’ for more info
community       : Set community
help            : Show this message
ip              : Set IP; use 'set ip help' for more info
logging         : Set system logging configuration information
module          : Set module; use 'set module help' for more info
motd            : Set Message of the Day
port            : Set port; use 'set port help' for more info
prompt          : Set prompt
snmp            : Set snmp; use 'set snmp help' for more info
system          : Set system; use 'set system help' for more info
time            : Set time and date
trap            : Set trap; use 'set trap help' for more info
```

*Command:* **set ip address**

*Description:* Reset the device IP address and mask.

*Syntax:* set ip address <if#> <IP address> <mask>

*Note:* The ‘if#’ is the interface number that appears in the ‘show interface’ table.

*Example:* Console>set ip address 2 100.132.66.38 255.255.255.0

```
Setting i/f 2 IP address to 100.132.66.38 with netmask
  255.255.255.0...
```

*Command:* **set ip help**

*Description:* Display the 'set ip' subcommands.

*Syntax:* set ip help

*Example:* Console>set ip help

| Command | Description |
|---|---|
| address | : Set IP address and mask |
| help | : Show this message |
| route | : Set IP route table entry |

*Command:* **set ip route**

*Description:* Set an IP route.

*Syntax:* set ip route <dest_ip> <gateway> [netmask]
set ip route default <gateway> [netmask]

*Note:* To change the default gateway, you must first delete the existing default gateway and then set the new gateway.

*Example #1:* Change the default gateway.

```
Console>clear ip route 0.0.0.0 100.132.65.98

delete net 0.0.0.0: gateway 100.132.65.98 (100.132.65.98)
Ok.

Console>set ip route default 100.132.65.97

add net 0.0.0.0: gateway 100.132.65.97 (100.132.65.97)
Ok.
```

*Example #2:* Establish a new gateway.

```
Console>set ip route 100.132.64.2 100.132.65.98

add host 100.132.64.2: gateway 100.132.65.98 (100.132.65.98)
Ok.
```

*Command:* **set logging add**

*Description:* Display messages of a given severity at the console.

*Syntax:* set logging add <severity>

*Note:* Messages are logged onto the screen only when connected via the serial console port. This command has no effect during a telnet session. Use 'show log severities' to determine available severities.

*Example:*
```
Console>set logging add fault

+ FAULT
Ok.

Console>set logging add fault fatal

+ FAULT
+ FATAL
Ok.
```

*Command:* **set logging all**

*Description:* Show all messages at the console.

*Syntax:* set logging all

*Example:*
```
Console>set logging all

Ok. All messages will be displayed.
```

*Command:* **set logging delete**

*Description:* Do not display message of a given severity at the console.

*Syntax:* set logging delete <severity>

*Note:* Use 'show log severities' to determine available severities. Messages are still logged, just not printed to the console.

*Example:*
```
Console>set logging delete print

- PRINT
Ok.

Console>set logging delete print info

- INFO
- PRINT
Ok.
```

*Command:* **set logging help**

*Description:* Show the 'set logging' subcommands.
*Syntax:* set logging help
*Example:* Console>set logging help

```
Command  Description
_______  ___________________________________

add      : Add a message severity to be displayed at the
           console.
all      : Send all log messages to the console.
delete   : Don't display a message severity at the console.
help     : Show this message.
none     : Don't send any log messages to the console.
```

*Command:* **set logging none**

*Description:* Do not show any messages at the console.
*Syntax:* set logging none
*Note:* Events will still be logged, just not displayed.
*Example:* Console>set logging none

```
Ok. No messages will be displayed.
```

*Command:* **set module asset**

*Description:* Set the asset tracking identifier for the module.
*Syntax:* set module asset <chassis> <module[-converter]> [<port> <remote>] <asset ID>
*Note:* Multi-word strings must be placed in quotes. There is a limit of 32 characters for the asset identifier. Do not use the following characters: **. : ; & = < >**.
*Example:* Console>set module asset 1 1 750444

```
Asset ID successfully set.
```

*Command:* **set module autorecover**

*Description:* Set Auto-Recovery on some 10/100Mbps line cards.
*Syntax:* set module autorecover <chassis> <module> <enable | disable>

*Note:* Auto-Recovery prevents a deadlock when LLR is enabled on two adjoining 10/100Mbps line cards.

*Example:*
```
Console>set module autorecover 1 13 enable

Auto Recover Successfully set.
```

*Command:* **set module autorevert**

*Description:* Set the Auto Restore Primary on a redundant interface line card.

*Syntax:* set module autorevert <chassis> <module> <enable | disable>

*Note:* This controls the ability to automatic revert back to the primary port if a secondary switchover has occurred. When the redundant interface line card ModeControl is selectAB, then this option is not selectable and a read of this value will always return not selectable.

*Example:*
```
Console>set module autorevert 1 11 enable

Auto Restore Primary successfully set.
```

*Command:* **set module backpressure**

*Description:* Enable or disable backpressure (half duplex flow control) on a 10/100Mbps line card.

*Syntax:* set module backpressure <chassis> <module> <enable | disable>

*Example:*
```
Console>set module backpressure 1 14 disable

Backpressure successfully set.
```

*Command:* **set module bootpdisable**

*Description:* Disable the BOOTP server.

*Syntax:* set module bootpdisable <chassis> <module>

*Note:* Only applicable to R502-M cards that are configured for a stack.

*Example:*
```
Console>set module bootpdisable 1 17

Bootp disabled.
```

*Command:* **set module bootpenable**

*Description:* Enable the BOOTP server.

*Syntax:* set module bootpenable <chassis> <module>

*Note:* Only applicable to R502-M cards that are configured for a stack.

*Example:*
```
Console>set module bootpenable 1 17

Bootp enabled.
```

*Command:* **set module disable**

*Description:* Disable a module, if possible.

*Syntax:* set module disable <chassis> <module>

*Note:* Typically this can't be done.

*Example:*
```
Console>set module disable 1 6

Module Admin Status can't be modified.
```

*Command:* **set module enable**

*Description:* Enable a module.

*Syntax:* set module enable <chassis> <module>

*Note:* Typically this can't be done.

*Example:*
```
Console>set module enable 1 3

Module Admin Status can't be modified.
```

*Command:* **set module fdflowctrl**

*Description:* Set full-duplex flow control on a 10/100Mbps line card.

*Syntax:* set module fdflowctrl <chassis> <module> <enable | disable>

*Note:* Not applicable to all 10/100Mbps line cards.

*Example:*
```
Console>set module fdflowctrl 1 13 disable

FD Flow Control Successfully set.
```

*Command:* **set module ftpdisable**

*Description:* Disable the FTP server.
*Syntax:* set module ftpdisable <chassis> <module>
*Note:* Only applicable to management cards.
*Example:* Console>set module ftpdisable 1 17

FTP disabled.

*Command:* **set module ftpenable**

*Description:* Enable the FTP server.
*Syntax:* set module ftpenable <chassis> <module>
*Note:* Only applicable to management modules.
*Example:* Console>set module ftpenable 1 17

FTP enabled.

*Command:* **set module help**

*Description:* Show 'set module' subcommands.
*Syntax:* set module help
*Example:* Console>set module help

| Command | Description |
|---|---|
| asset | : User supplied asset ID (32 characters maximum). |
| autorecover | : Auto recovery for LLCF with LLR deadlock potential. |
| autorevert | : Revert to primary port if secondary switchover occurred. |
| backpressure | : Half Duplex Flow Control. |
| bootpdisable | : Disable bootp server. |
| bootpenable | : Enable bootp server. |
| disable | : Disable module and reflect it in Admin Status. |
| enable | : Enable module and reflect it in Admin Status. |
| fdflowctrl | : Full Duplex Flow Control. |
| ftpdisable | : Disable FTP server. |
| ftpenable | : Enable FTP server. |
| help | : Show this message. |
| image | : Select boot/core images to be used at boot time. |
| llcf | : Link Loss Carry Forward. |
| name | : User supplied name (32 characters maximum). |
| redabsel | : Select output port A (Primary) or B (Secondary) for SelectAB mode. |

| | |
|---|---|
| redlink | : Send link on unselected port when in Dynamic Recovery Mode. |
| redloa | : Set Loss of Activity time in seconds (1-31). |
| redmode | : Select Dynamic Recovery or SelectAB mode of redundant operation. |
| redtx | : Send to both primary and secondary output ports. |
| sduplexAll | : Sets duplex for all ports on module. |
| sfdflowctrlAll | : Sets Full Duplex Flow Control for all ports on module. |
| shdflowctrlAll | : Sets Half Duplex Flow Control for all ports on module. |
| SONAR | : Switch On No Activity Received. |
| telnetdisable | : Disable telnet server. |
| telnetenable | : Enable telnet server. |
| webdisable | : Disable web server. |
| webenable | : Enable web server. |
| webredirect | : Redirect web user (browser) to this URL. |
| webselect | : Use this local IP or the redirect URL for response to web user. |
| write | : Inhibit remotely connected module control of local module. |

*Command:* **set module image**

*Description:* Select the boot or core image file to be used at start-up. Transfer the file via FTP or a specified file path.

*Syntax:* set module image <boot | core> <chassis> <module> <URL>

*Options:* URL is either one of the following options:
file://<[path/]filename>
ftp://<username>:<password>@<IP address> [:<port>]/<[path/]filename>

*Note:*
1. Only applicable to management modules.
2. If the boot or core image file is located in the root directory of the target management card, you may enter only the file name. Otherwise, enter the path to the file.
3. If the port field is not entered or set to zero, the default FTP server port is used.
4. Getting a file via FTP will lock you out of the first system you were connected to.
5. If you have FTP available on your PC, you can get the image directly by entering the IP address of your PC in the URL field.

*Example #1:* Obtain the boot image through a local file path. This command can only get files from the local system you

are connected to.

```
Console>set module image boot 1 17 file://44.0.0/boot.bin
.....
Operation complete.
Console>
```

*Example #2:* Obtain the boot image through FTP.

```
Console>set module image boot 2 12 ftp://
admin:admin@100.175.3.17/boot.bin
......
Operation complete.
Console>
```

The following is an example of what appears on the console screen of the system getting the file.

```
Console>Connected to 100.175.3.17
220 100.175.3.17 pSOSystem FTP server (@(#)(#)pVER IA/PPC,
Version 3.4.0) ready.
331 Password required for admin.
230 User admin logged in.
200 Type set to I.
200 PORT command successful.
150 Opening BINARY mode data connection for boot.bin (616900 bytes)
226 Transfer complete.
6161900 bytes received in 8 seconds (75 Kbytes/s)
221 Goodbye.
UPDT  :00000000: SEVERE (WARNING: Boot image update in
progress. This process MUST NOT be interrupted or the board will
be unable to boot)
UPDT  :00000000: SEVERE (Copying file 44.0.0/boot.bin to boot
image FLASH)
UPDT  :00000000: SEVERE (Clearing lock on boot image FLASH
sectors)
UPDT  :00000000: SEVERE (Erasing boot image FLASH sectors)
UPDT  :00000000: SEVERE (Starting to write boot image FLASH)
UPDT  :00000000: SEVERE (Setting lock on boot image FLASH
sectors)
UPDT  :00000000: SEVERE (Performing verification of updated
boot image in FLASH)
UPDT  :00000000: SEVERE (FLASH boot image successfully
updated from file 44.0.0/boot.bin)
```

*Command:* **set module llcf**

*Description:* Modify Link Loss Carry Forward status.

*Syntax:* set module llcf <chassis> <module[-converter]> [<port> <remote>] <enable | disable>

*Note:*
1. Pertains to the ability of an input port to forward the link test pulse to its output port. If disabled, the output port will always generate link pulses, regardless of input port link status. This feature is not available on all modules.
2. If LLCF is enabled on a remote access line card and it loses its link on the copper port, you will no longer be able to manage the remote device.

*Example:*

```
Console>set module llcf 1 11 disable

LLCF successfully set.
```

*Command:* **set module name**

*Description:* Set a module's name.

*Syntax:* set module name <chassis> <module[-converter]> [<port> <remote>] <name>

*Note:* Multi-word strings must be placed in quotes. There is a limit of 32 characters for the module name. Do not use the following characters:
**. : ; & = < >.**

*Example:*

```
Console>set module name 1 8 "Module Name"

Name successfully set.
```

*Command:* **set module redabsel**

*Description:* Set the output port A (Primary) or B (Secondary) for a redundant interface line card.

*Syntax:* set module redabsel <chassis> <module> <selectA | selectB>

*Note:* The mode of the redundant interface line card must be selectAB. (See *Command:* **set module redmode** for details.)

*Example:*

```
Console>set module redabsel 1 11 selectA

ABSelect successfully set.
```

*Command:* **set module redlink**

*Description:* Set the Link Pulse Control on a redundant line card. Link pulses are sent on the inactive port when enabled.

*Syntax:* set module redlink <chassis> <module> <enable | disable>

*Note:* Must be in Dynamic Recovery mode.

*Example:*
```
Console>set module redlink 1 11 enable

Link Pulse Control successfully set.
```

*Command:* **set module redloa**

*Description:* Set the Loss of Activity (LOA) time in seconds (1-31) on a 1000Mbps redundant line card. With SONAR enabled, if the active port remains idle longer than the time specified, the card will check for activity on the secondary port and switchover if activity is detected.

*Syntax:* set module redloa <chassis> <module> <time>

*Note:* Time is any number from 1 to 31.

*Example:*
```
Console>set module redloa 1 16 10

LOA time successfully set.
```

*Command:* **set module redmode**

*Description:* Set the mode of a redundant interface line card.

*Syntax:* set module redmode <chassis> <module> <DynamicRecovery | SelectAB>

*Note:* Dynamic Recovery mode provides automatic switchover for port failure redundancy while selectAB provides a basic A/B port selector. This status is relevant to several other 'set module' commands.

*Example:*
```
Console>set module redmode 1 11 SelectAB

Mode Control successfully set.
```

*Command:* **set module redtx**

*Description:* Set the transmission status of a redundant interface line card.

*Syntax:* set module redtx <chassis> <module> <enable | disable>

*Note:* The ability of the primary and secondary output ports to transmit the received main input signal simultaneously; must be in Dynamic Recovery mode.

*Example:*

```
Console>set module redtx 1 11 enable

Transmission Mode successfully set.
```

*Command:* **set module sduplexAll**

*Description:* Set all the ports on a chassis stacking line card to half or full duplex.

*Syntax:* set module sduplexAll <chassis> <module> <half | full>

*Note:* If auto-negotiation is enabled on a port, it will ignore this setting.

*Example:*

```
Console>set module sduplexAll 3 1 full

Duplex successfully set.
```

*Command:* **set module sfdflowctrlAll**

*Description:* Enable or disable Full Duplex (FD) Flow Control on all ports of a chassis stacking line card.

*Syntax:* set module sfdflowctrlAll <chassis> <module> <enable | disable>

*Note:* FD Flow Control only pertains to a port when it is in full-duplex mode, auto-negotiation is enabled on the port, and its link partner has indicated that it supports PAUSE frames.

*Example:*

```
Console>set module sfdflowctrlAll 3 1 enable

FD Flow Control successfully set.
```

*Command:* **set module shdflowctrlAll**

*Description:* Enable or disable Half Duplex (HD) Flow Control on all ports of a chassis stacking line card.

*Syntax:* set module shdflowctrlAll <chassis> <module> <enable | disable>

*Note:* Only applicable to ports operating at half duplex.

*Example:*
```
Console>set module shdflowctrlAll 3 1 enable

HD Flow Control successfully set.
```

*Command:* **set module SONAR**

*Description:* Modify the Switch On No Activity Received (SONAR) status on a redundant interface line card.

*Syntax:* set module SONAR <chassis> <module> <enable | disable>

*Note:* With SONAR enabled, the module will switch ports if it detects a loss of activity for two seconds at the active port, or for the configured time (1-31 seconds) for a Gigabit redundant line card. To enable SONAR, the module must be in Dynamic Recovery mode and redlink must be enabled.

*Example:*
```
Console>set module SONAR 1 4 enable

SONAR successfully set.
```

*Command:* **set module telnetdisable**

*Description:* Disable the Telnet server.

*Syntax:* set module telnetdisable <chassis> <module>

*Note:* Only applicable to management modules.

*Example:*
```
Console>set module telnetdisable 1 17

Telnet disabled.
```

*Command:* **set module telnetenable**

*Description:* Enable the Telnet server.

*Syntax:* set module telnetenable <chassis> <module>

*Note:* Only applicable to management modules.

*Example:*
```
Console>set module telnetenable 1 17

Telnet enabled.
```

*Command:* **set module webdisable**

*Description:* Disable the Web server.

*Syntax:* set module webdisable <chassis> <module>

*Note:* Only applicable to management modules.

*Example:*
```
Console>set module webdisable 1 17

Web disabled.
```

*Command:* **set module webenable**

*Description:* Enable the Web server.

*Syntax:* set module webenable <chassis> <module>

*Note:* Only applicable to management modules.

*Example:*
```
Console>set module webenable 1 12

Web enabled.
```

*Command:* **set module webredirect**

*Description:* Redirect the Web browser to point to the assigned URL instead of the IP address of the selected chassis.

*Syntax:* set module webredirect <chassis> <module> http://<URL>

*Note:* Only applicable to management modules. To enable this function, 'set module webselect' must be set to 'redirect.'

*Example:*
```
Console>set module webredirect 1 17 http://
www.metrobility.com

Web redirect URL successfully set.
```

*Command:* **set module webselect**

*Description:* Set the Web server to select either the local IP address or the redirected URL.

*Syntax:* set module webselect <chassis> <module> <local | redirect>

*Example:*

```
Console>set web select 1 17 local

Web select successfully set.
```

*Command:* **set module write**

*Description:* Set the write protection on a locally managed access line card. This prevents a remote card from controlling the locally managed card.

*Syntax:* set module write <chassis> <module> [<port> <remote>] <ReadOnly | ReadWrite>

*Note:* Only applicable to locally managed access line cards.

*Example:*

```
Console>set module write 1 4 ReadOnly

Write Protect successfully set.
```

*Command:* **set motd**

*Description:* Set the message of the day displayed at login.

*Syntax:* set motd <motd>
set motd

*Example:*

```
Console>set motd

The current message of the day:

This is file motd

Enter message of the day, use '.' to indicate completion

This is a new "motd"
and it contains 2 lines
.

Done.
```

New message of the day:
This is a new "motd"
and it contains 2 lines

Ok.

*Command:* **set port autoneg**

*Description:* Modify the auto-negotiation status on the copper port of a card with this feature.

*Syntax:* set port autoneg <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

*Note:*
1. For a 10/100Mbps card or a chassis stacking line card, auto-negotiation determines how a port advertises its speed and duplex capabilities. Auto-negotiation is dependent on both the speed and duplex switch settings.
2. For an access line card, the copper port advertises full/half duplex capability when auto-negotiation is enabled. Speed is always 100Mbps. When auto-negotiation is disabled, the port operates in full duplex. Auto-negotiation must be enabled if the device connected to the copper port is set to half duplex.

*Example:*
```
Console>set port autoneg 2 10 1 disable

Auto Negotiate successfully set.
```

*Command:* **set port bandwidth**

*Description:* Set the receive or transmit bandwidth on an access line card's copper port to the specified bandwidth in 1Mb increments.

*Syntax:* set port bandwidth <transmit | receive> <chassis> <module> <port> [<remote> <remoteport>] <bandwidth>

*Note:* Bandwidth is any number from 1 to 100.

*Example:*
```
Console>set port bandwidth transmit 2 11 1 75

Transmit Bandwidth successfully set.
```

*Command:* **set port bert**

*Description:* Set the Bit Error Rate Test on a T1/E1 card. When enabled, the card generates a 511 pattern on the data channel. For normal operation, this function should be disabled.

*Syntax:* set port bert <chassis> <module> <port> <enable | disable>

*Note:* Only applies to the fiber port of a T1/E1 line card. Remote loopback must be enabled separately if you want the test data returned to the sender.

*Example:*

```
Console>set port bert 1 14 2 disable

BERT511 successfully set.
```

*Command:* **set port burstlength**

*Description:* Set the maximum receive or transmit burst size on an access line card's copper port. This allows traffic to flow at line rate until the burst limit is reached.

*Syntax:* set port burstlength <receive | transmit> <chassis> <module> <port> [<remote> <remoteport>] <16KB | 32KB | 64KB | 128KB | 256KB>

*Example:*

```
Console>set port burstlength receive 2 11 2 1 1 64KB

Receive Burst Length successfully set.
```

*Command:* **set port disable**

*Description:* Disable a port.

*Syntax:* set port disable <chassis> <module> <port>

*Note:* This command only applies to management, TDM, and access line cards.

*Example:*

```
Console>set port disable 2 3 2

Admin Status successfully set.
```

*Command:* **set port dislbkres**

*Description:* Determines the response of the fiber port when it receives the remote loopback command. When enabled, the port ignores the remote loopback command. When disabled, the port enters remote loopback mode. During remote loopback mode, data on the fiber port to looped back to the sender.

*Syntax:* set port dislbkres <chassis> <module> <port>

*Note:* Only applicable to R133-xx cards.

*Example:* Console>set port dislbkres 2 6 2 disable

Disable Loopback Response successfully set.

*Command:* **set port duplex**

*Description:* Modify a port's duplex mode.

*Syntax:* set port duplex <chassis> <module> <port> <duplex>

*Note:* Duplex is either half or full.

*Example:* Console>set port duplex 2 14 2 full

Port duplex successfully set.

*Command:* **set port enable**

*Description:* Enable a port.

*Syntax:* set port enable <chassis> <module> <port>

*Note:* This only applies to management, TDM, and access line cards.

*Example:* Console> set port enable 2 3 2

Admin Status successfully set.

*Command:* **set port fault**

*Description:* Set the Far End Fault on an access line card or TDM port. This allows the locally managed card to detect a break in the remote card's fiber port receiver.

*Syntax:* set port fault <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

*Example:*
```
Console> set port fault 2 3 2 enable

Remote Fault successfully set.
```

*Command:* **set port fefenable**

*Description:* Set the Far End Fault on an R133-xx port. This allows the locally managed card to detect a break in the remote card's fiber port receiver.

*Syntax:* set port fefenable <chassis> <module> <port> <enable | disable>

*Note:* To function properly, the Far End Fault setting must be the same on both the local and remote cards. Far End Fault is not applicable to the copper port.

*Example:*
```
Console> set port fefenable 2 6 2 enable

Far End Fault Enable successfully set.
```

*Command:* **set port help**

*Description:* Show 'set port' subcommands.

*Syntax:* set port help

*Example:*
```
Console>set port help

Command     Description
_______     ___________________________

autoneg     : Autonegotiation of duplex and/or speed.
bandwidth   : Provision bandwidth (1Mb increments).
bert        : Transmit BERT511 on TDM port.
burstlength : Burst at line rate for specified buffer size.
disable     : Disable port.
dislbkres   : Disable loopback response when requested
              from remote port.
duplex      : Set port transmission to full or half duplex.
enable      : Enable port.
```

| | |
|---|---|
| fault | : Far End Fault generation when receive fiber fails (ALC and TDM). |
| fefenable | : Far End Fault generation when receive fiber fails. |
| help | : Show this message. |
| linebuildout | : Copper port line length (T1/E1). |
| linecode | : Set port linecode. |
| llr | : Set port link loss return. |
| loopback | : Set port loopback. |
| name | : Set port name. |
| remotelpbk | : Set remote loopback. |
| speed | : Set port speed (10/100 Mbps). |

*Command:* **set port linebuildout**

*Description:* Set the line length for a copper port on a T1/E1 line card.

*Syntax:* set port linebuildout <chassis> <module> <port> [<remote> <remoteport>] <linebuildout>

where <linebuildout> is

| T1 | E1 |
|---|---|
| 0-133ft/0dB | short |
| 133-266ft | long |
| 266-399ft | |
| 399-533ft | |
| 533-655ft | |
| -7.5dB | |
| -15dB | |
| -22.5dB | |

*Note:* For T1 cards, <linebuildout> may be shortened to the first four characters of the option (for example, type "133-" instead of "133-266ft").

*Example:*

```
Console>set port linebuildout 1 14 1 133-266ft

Line Length successfully set.
```

*Command:* **set port linecode**

*Description:* Select whether AMI or B8ZS/HDB3 line coding will be used for receiving and transmitting data.

*Syntax:* set port linecode <chassis> <module> <port> <AMI | [B8ZS | HDB3]>

*Note:* 1. B8ZS is the T1 default setting; HDB3 is the E1 default.
2. Only applies to the copper port of a T1/E1 card.

*Example:*
```
Console>set port linecode 1 14 1 AMI

Line Coding successfully set.
```

*Command:* **set port llr**

*Description:* Enable or disable a fiber port's Link Loss Return status.

*Syntax:* set port llr <chassis> <module[-converter]> <port> [<remote> <remoteport>] <enable | disable>

Note: Not available on all modules. When enabled, the fiber port's transmitter shuts down if its receiver fails to detect a valid receive link. LLR should only be enabled on one end of the link and is typically enabled on either the unmanaged or remote device. Do not enable LLR on both ends of a configuration, otherwise the link will never be established.

*Example:*
```
Console>set port llr 2 2 2 disable

LLR successfully set.
```

*Command:* **set port loopback**

*Description:* Enable or disable the loopback feature on a TDM or access line card. For an access line card, this mode allows a port to return its incoming data back to the sender, while continuing to receive and transmit management packets. The management packets are not looped back to the sender, only the data is returned. For a TDM card, the local copper or fiber port can be configured to loop back its incoming data. For a T3/E3 card, the incoming data is also transmitted to the remote device.

*Syntax:* set port loopback <chassis> <module> <port> [<remote> <remoteport>] <enable | disable>

*Note:* For an access line card, loopback can only be applied to one port at a time because when you enable loopback on a port, the other port on the module is automatically disabled (no link). Loopback can only be set on the fiber port.
For a T1/E1 card, loopback can be applied to one or both ports simultaneously. For a T3/E3 card, loopback cannot be applied simultaneously.

*Example:*
```
Console>set port loopback 2 11 2 1 2 enable

Loopback successfully set.
```

*Command:* **set port name**

*Description:* Set a port's name.

*Syntax:* set port name <chassis> <module[-converter]> <port> [<remote> <remoteport>] <name>

*Note:*
1. Multi-word strings must be placed in quotes.
2. There is a limit of 32 characters for the port name. Do not use the following characters: **. : ; &** = < >.
3. Port names cannot be set to blank.

*Example:*
```
Console>set port name 1 1 1 "port one"

Name successfully set.
```

*Command:* **set port remotelpbk**

*Description:* Enable or disable remote fiber loopback on a T1/E1 card. When enabled, data on the fiber line is looped back at the remote end to the sending device. For normal operation, disable this function.

*Syntax:* set port remotelpbk <chassis> <module> <port> <enable | disable>

*Note:* Only applies to the fiber port of a T1/E1 card.

*Example:*
```
Console>set port remotelpbk 1 14 2 enable

WARNING — This will interrupt user traffic
```

Continue with Remote Loopback? [Y/N]y

Remote Loopback successfully set.

*Command:* **set port speed**

*Description:* Modify a port's speed in Mbps.

*Syntax:* set port speed <chassis> <module> <port> <speed>

*Note:* Only applicable to 10/100 modules. Speed is either 10 or 100.

*Example:* Console>set port speed 1 4 2 100

Speed successfully set.

*Command:* **set prompt**

*Description:* Set the console and telnet prompts.

*Syntax:* set prompt <prompts>
set prompt <console prompt> <telnet prompt>

*Example:* Console>set prompt -> Telnet>
Ok. Setting console prompt to ->

Ok. Setting telnet prompt to Telnet>

->

*Command:* **set snmp community**

*Description:* Set the SNMP community names.

*Syntax:* set snmp community <get | set> [name]

*Note:* If the string is left blank, access to the community will be unprotected.

*Example:* Console>set snmp community get public

Ok.

*Command:* **set snmp help**

*Description:* Show the 'set snmp' subcommands.
*Syntax:* set snmp help
*Example:* Console>set snmp help

```
Command     Description
-------------------------------------
community   : Set community string
help        : Show this message
```

*Command:* **set system contact**

*Description:* Set the MIB-2 system contact string.
*Syntax:* set system contact <contact>
*Note:* Multi-word strings must be placed in quotes.
*Example:* Console>set system contact "Sys Admin"

```
Ok.
```

*Command:* **set system help**

*Description:* Show the 'set system' subcommands.
*Syntax:* set system help
*Example:* Console>set system help

```
Command     Description
-------------------------------------
contact     : Set system contact
help        : Show this message
location    : Set system location
name        : Set system name
```

*Command:* **set system location**

*Description:* Set the MIB-2 system location string.
*Syntax:* set system location <location>
*Note:* Multi-word strings must be placed in quotes.
*Example:* Console>set system location Nashua

```
Ok.
```

*Command:* **set system name**

*Description:* Set the MIB-2 system name string.

*Syntax:* set system name <name>

*Note:* Multi-word strings must be placed in quotes.

*Example:*
```
Console>set system name "Metrobility hub"

Ok.
```

*Command:* **set time**

*Description:* Set time and date.

*Syntax:* set time <mm/dd/yyyy> <hh:mm:ss>

*Example:*
```
Console>set time 05/18/2003 15:00:00

Date 05/18/2003
Time 15:00:00
```

*Command:* **set trap control**

*Description:* Enable or disable specific traps.

*Syntax:* set trap control <trap_index> <enable | disable>

*Note:* The 'trap_index' is the number to the left of the Trap Name in the 'show trap control' table (e.g., 4 is the index for the Generic Link Up trap).

*Example:*
```
Console>set trap control 4 disable

Ok.
```

*Command:* **set trap destination**

*Description:* Add a management station as a destination for traps; or modify an existing destination's status, name or SNMP version.

*Syntax:*

*To add an entry:*

set trap destination <IP address> <UDP port> create <active | inactive> [name] [V1 | V2]

*To modify an entry:*

set trap destination <IP address> <UDP port> <active | inactive>

set trap destination <IP address> <UDP port> <name>

set trap destination <IP address> <UDP port> <V1 | V2>

*Notes:*

1. Use ‘show trap destination’ to view trap destination details.
2. NetBeacon automatically adds itself to the Trap Destination table. Removing or uninstalling the entry will have an adverse effect on NetBeacon.

*Example:*

```
Console>set trap destination 100.132.65.99 9162 create active
  MyPC V2

Trap Destination Entry added

Console>show trap destination

IP Address      Udp Port  Status  Name                  Snmp Version
-------------------------------------------------------------------
100.132.60.19   9162      Active  NetBeacon 100.132.60.19   V1
100.132.65.99   9162      Active  MyPC                      V2

Console>set trap destination 100.132.65.99 9162 V1

Console>show trap destination

IP Address      Udp Port  Status  Name                  Snmp Version
-------------------------------------------------------------------
100.132.60.19   9162      Active  NetBeacon 100.132.60.19   V1
100.132.65.99   9162      Active  MyPC                      V1
```

*Command:* **set trap help**

*Description:* Show ‘set trap’ subcommands.

*Syntax:* set trap help

*Example:*

```
Console>set trap help

Command      Description
-------------------------------
control      : Set SNMP trap control
destination  : Set SNMP trap destination
help         : Show this message
```

**Show Command**

*Command:* **show communities**

*Description:* Show community information.
*Syntax:* show communities
*Example:* Console>show communities

SNMP Community information:
get-request community: 'public'
set-request community: 'public'

*Command:* **show snmp community**

*Description:* Show SNMP community information.
*Syntax:* show snmp community
*Example:* Console>show snmp community

SNMP Community information:
get-request community: 'public'
set-request community: 'public'

*Command:* **show snmp help**

*Description:* Display the 'show SNMP' subcommands.
*Syntax:* show snmp help
show snmp ?
*Example:* Console>show snmp ?

| Command | Description |
|---|---|
| community | : Show SNMP community strings |
| help | : Show this message |

**User Commands**

*Command:* **user -all**

*Description:* Display all the user/password lists.
*Syntax:* user -all
*Example:* Console>user -all

admin:~N6H1~B:20:20:Administrator:/:psh
guest:~H~Dh`1:30:30:guest:/:psh

*Command:* **user -delete**

*Description:* Delete a user.

*Syntax:* user -delete <username>

*Example:*
```
Console>user -delete guest

User guest deleted
```

*Command:* **user -help**

*Description:* Show 'user -' subcommands.

*Syntax:* user -help

*Example:*
```
Console>user -help
Usage: user
 -all                          Display user/password lists
 -delete <username>            Delete user
 -help                         usage
 -set <username> <password> <uid> <gid> <description>
   <home directory>            Add user
```

*Command:* **user -set**

*Description:* Add a new user.

*Syntax:* user -set <username> <password> <uid> <gid> <description> <home directory>

*Note:* You can only add a user with the same or lower privilege than yourself (e.g., an admin can only add another admin or guest, but not a root user).
The uid (user ID) and gid (group ID) numbers must be the same. For a root user, the uid and gid must be 10; for an admin, choose a number from 11 to 20; and for a guest, use any number equal to or greater than 21.

*Example:*
```
Console>user -set guest guest 30 30 Guest /
User guest added
```

**Utility Commands**

*Command:* **cat**

*Description:* Concatenate and display files.

*Syntax:* cat [-benstv] <filename …>

*Options:*
-b Number the non-blank lines.
-e Display non-printing characters including a $

character at the end of each line.

-n Precede each line output with its line number.

-s Substitute a single blank line for multiple adjacent blank lines.

-t Display non-printing characters including the [tab] character.

-v Display non-printing characters excluding the [tab] and [newline] characters.

*Example:* Console>cat motd

This is the message of the day

*Command:* **copyboot**

*Description:* Copy a boot image to the boot sector of flash.

*Syntax:* copyboot <filename>

*Notes:* **IMPORTANT! <u>Do not</u> interrupt or power cycle the system once copyboot has been initiated — it will render the card inoperative.**

*Example:* Console>copyboot boot.bin

Warning: If this file was transferred using FTP, please make sure the BINARY option was specified.

Warning: This process MUST NOT be interrupted or else the board will not be able to boot.

Do you want to Continue? [N] y
Copying boot.bin to flash.
Clearing lock on boot sectors.
Clearing boot sectors.
Writing boot image.
Each . equals 10K bytes flashed
.....
Locking boot sectors.
Ok.

*Command:* **echo**

*Description:* Echo arguments to standard output.

*Syntax:* echo [-n] [argument …]

*Note:* The -n option keeps a new line from being added to the output.

*Example:*

```
Console>echo hello

hello
```

*Command:* **ftp**

*Description:* File Transfer Protocol client.

*Syntax:* ftp

ftp <host>

*Example:*

```
Console>ftp 100.132.65.23

Connected to 100.132.65.23.
220 JD FTP Server ready.
Name (100.132.65.23:root): tftp

331 Username OK, send identity (email address) as
password.
Password:
230 User logged in.

ftp> help

Commands may be abbreviated. Commands are:

!          cr         mdelete    sendport   runique
account    delete     mdir       put        send
append     dir        mget       pwd        status
ascii      disconnect mkdir      quit       sunique
bell       get        mls        quote      tenex
binary     glob       mode       recv       type
bye        hash       mput       remotehelp  user
cd         help       nlist      rename     verbose
cdup       lcd        open       reset      ?
close      ls         prompt     rmdir
```

*Command:* **head**

*Description:* Display the first n lines of a file.

*Syntax:* head [-n] <filename...>

*Note:* The default value of n is 10.

*Example:* Console>head /etc/hosts

```
#
# This file contains the mappings of IP addresses
# to host names. Each entry should be kept on an
# individual line. The IP address should be placed
# in the first column followed by the
# corresponding host name. The IP address and the
# host name should be separated by at least
  # one space.
#
# <ip address> <hostname> [#<comment>]
#
# Additionally, comments (such as these) may be
# inserted on individual
```

*Command:* **nvclear**

*Description:* Reset previously defined nvram settings.

*Syntax:* nvclear [-options]

*Options:*

| | |
|---|---|
| -all | Initializes all nvram to 0. Clears all boot, system, and network settings; system defaults are used during the next reboot. |
| -boot | Initializes boot handoff nvram to 0. Resets boot parameters to factory defaults; includes the image to load and the diagnostic status. |
| -core | Initializes core cfg nvram to 0. Resets core configuration data; console prompts are also reset. |
| -evlog | Initializes non-volatile event log nvram to 0. Clears all entries in the event log. |
| -os | Initializes operating system cfg nvram to 0. Resets operating system parameters to factory defaults; includes tftp boot vs. filesystem load, IP configuration via |

| | |
|---|---|
| | BOOTP, RARP, or static address. |
| -time | Initializes reset time storage nvram to 0. |
| -help | Usage.<br>Displays 'nvclear' command options. |

*Command:* **password**

*Description:* Change a password.

*Syntax:* password <username>

*Note:* You will not be prompted for the old password if you are changing the password for a privilege lower than the current session.

*Example:*

```
Console>password root

Enter the old root password.

Enter the new root password.

Enter the new root password again.

Ok. root password changed.
```

*Command:* **tail**

*Description:* Display n lines of a file beginning at the designated place.

*Syntax:* tail [+|-number [lc]] <filename>

Note: The default displays the last 10 lines of a file.

*Options:*

| | |
|---|---|
| +number | Begin displaying at a distance number from the beginning of the file. Number is counted in units of lines or characters, according to the l or c option. The default number is 10. |
| -number | Begin displaying at distance number from the end of the file. |
| l | Number is counted in units of lines. |
| c | Number is counted in units of characters. |

*Example:*

```
Console>tail /etc/hosts
#
# For example:
#
#   102.54.94.97  rhino.acme.com     # source server
```

```
#   38.25.63.10    x.acme.com          # x client host
#

127.0.0.1    localhost

#
```

*Command:* **telnet**

*Description:* Telnet client.
*Syntax:* telnet <host>
*Example:* Console>telnet 100.132.65.29

```
Trying...

  +****************************************************************+
* Metrobility 17 Slot Chassis 19"                                  *
*                                                                  *
* Fri May  9 15:52:31 2003                                         *
* Version: 3.4.0 (Apr 30 2003)                                     *
* Serial Number: PR203                                             *
*                                                                  *
* Copyright 1998 - 2003 Metrobility Optical Systems, Inc.          *
*                                                                  *
  +****************************************************************+
login:
```

*Command:* **tftp**

*Description:* Trivial file transfer protocol client.
*Syntax:* tftp <host>
*Note:* When using TFTP to transfer files to the management card, always verify the file size after completing the transfer. If the file size is different, repeat the file transfer or use FTP to transfer the file (preferred). Rebooting the card after a partial file transfer may result in the failure of the management card to boot and require the card to be returned for repair.
*Example:* Console>tftp 100.132.65.23

```
Connected to 100.132.65.23
tftp> help
Commands may be abbreviated. Commands are:

connect         connect to a site
mode            change the file transfer mode
put             put a file to a remote site
get             get a file from a remote site
verbose         toggle verbose mode
trace           toggle packet tracing mode
remxit          set the number of retransmits
timeout         set the timeout for retransmits
quit            exit tftp
status          print status information
option          toggle option negotiation
blksize         set the blocksize for transfers
filesize        set the maximum file size for receive
?               print help information
tftp> quit
```

*Command:* **touch**

*Description:* Update the modification time of a file. A file is created if it does not already exist.

*Syntax:* touch [-cf] <filename...>

*Options:*
- -c Do not create file if it does not already exist.
- -f Attempt to force the touch regardless of read and write permissions on filename.

*Example:* Console>touch motd

## *Root Privilege Commands*

Root privilege commands should only be used by a system administrator under the direction of a Metrobility support engineer to customize or recover the system and internal file system. **IMPORTANT! These commands can render the system inoperable.**

The default password is: **root**

*Command:* **clear snmp user**

*Description:* Delete an SNMP user.

*Syntax:* clear snmp user <username>

*Example:*

```
Console>clear snmp user tempuser

Ok.
```

*Command:* **cp**

*Description:* Copy files or directories.

*Syntax:* cp [-i] <source> <target>
cp [-irR] <source1 ... sourceN> <directory>

*Options:*

-i Prompt before overwriting an existing file.

-r See R.

-R Recursive. If any source files are directories, copy the directory along with its files. Destination must be a directory.

*Note:* As a security feature, password files will not be valid if they are copied into the /etc directory.

*Example:*

```
Console>ls

acl  hosts  motd  passwd
Console>cp motd motw

Console>ls

acl  hosts  motd  motw  passwd
```

*Command:* **delhost**

*Description:* Delete an entry from the /etc/hosts file.

*Syntax:* delhost <address>

*Example:*

```
Console>delhost 100.132.65.29

DNS entry 100.132.65.29 deleted
```

*Command:* **getaddr**

*Description:* Get an IP address from a host name in /etc/hosts.

*Syntax:* getaddr <hostname>

*Example:* Console>getaddr mymachine

Hostname: mymachine, Hostaddress:
100.132.065.099

*Command:* **gethname**

*Description:* Get a host name from an IP address in /etc/hosts.

*Syntax:* gethname <address>

*Example:* Console>gethname 100.132.65.99

Hostname: mymachine, Hostaddress:
100.132.065.099

*Command:* **ifconf**

*Description:* Configure network interface parameters.

*Syntax:* ifconf ni_number [af [address [dest_addr] ] [up] [down] [netmask mask] [broadcast broad_addr] ] [arp | -arp]
ifconf -a

*Note:* The command 'ifconf 1 down' is disabled on the first interface of the management card. This protects the management interface from accidently being taken down.

*Example:* Console>ifconf -a

1: flags=124201<BROADCAST,UP>
inet 100.132.65.44 netmask ffffff00
broadcast 100.132.65.255
6: flags=212<NOARP,UP>
inet 127.0.0.1 netmask ff000000

*Command:* **mkdir**

*Description:* Create a directory.

*Syntax:* mkdir [-p] <dirname ...>

*Note:* The -p option allows missing parent directories to be created.

*Example:*
```
Console>mkdir mydir

Console>ls

acl  hosts  motd  mydir  passwd
```

*Command:* **mount**

*Description:* Mount a pHILE+ formatted volume on the file system.

*Syntax:*
mount
mount <volume_name> [sync_mode]

*Options:* The sync_mode is one of the following:
0 Specifies immediate-write synchronization mode.
1 Specifies control-write synchronization mode.
2 Specifies delayed-write synchronization mode (default).

*Example:*
```
Console>mount 5.0.0
```

*Command:* **mv**

*Description:* Move files or directories.

*Syntax:*
mv [-if] <source> <target>
mv [-if] <source1 ... sourceN> <directory>

*Options:*
-i Prompt before overwriting an existing file.
-f Allow files to be overwritten without being prompted.

*Example:*
```
Console>ls

acl  hosts  motd  passwd
Console>mv motd motw

Console>ls

acl  hosts  motw  passwd
```

*Command:* **rm**

*Description:* Remove (unlink directory entries for) one or more files.

*Syntax:* rm [-fir] <filename ...>

*Options:*
- -f Delete read-only files without asking for permission.
- -i Prompt for confirmation before removing a file.
- -r Recursively delete the contents of a directory, its subdirectories and the directory itself.

*Example:*

```
Console>ls

hosts  motw  passwd
Console>rm motw

Console>ls

hosts  passwd
```

*Command:* **rmdir**

*Description:* Remove a directory.

*Syntax:* rmdir <directory ...>

*Example:*

```
Console>ls -F

file2  mydir/
Console>rmdir mydir

Console>ls

file2
```

*Command:* **set snmp user**

*Description:* Create an SNMP user.

*Syntax:* set snmp user <username> [auth-type <md5 | sha> <password>]

*Example:*

```
Console>set snmp user tempuser auth-type sha temp

Ok.
```

*Command:* **setenv**

*Description:* Set or show environmental variables.

*Syntax:* setenv
setenv <variable> <value>

*Note:* TERM and HOME are the only variables that can be changed.

*Example:*
```
Console>setenv

CVOL=44.0.0
CDIR=/
LOGNAME=root
UID=10
GID=10
IND=0
OUTD=0
TERM=ansi
HOME=/
```

*Command:* **sethost**

*Description:* Set an entry in the /etc/hosts file for DNS resolution.

*Syntax:* sethost <hostname> <address>

*Example:*
```
Console>sethost chassis29 100.132.65.29

DNS entry added for Hostname: chassis29, Hostaddress:
 100.132.65.29
```

*Command:* **show snmp engineID**

*Description:* Show the unique engine identifier for an SNMPv3 agent.

*Syntax:* show snmp engineID

*Example:*
```
Console>show snmp engineID

EngineID
_____________________________

80000ab9054230303439303039333 7
```

*Command:* **show snmp user**

*Description:* Show the SNMP user(s).
*Syntax:* show snmp user
*Example:* Console>show snmp user

| User Name | Authentication | Privacy |
|---|---|---|
| defaultuser | None | None |
| tempuser | SHA | None |

*Command:* **sync**

*Description:* Force all file system blocks to be updated.
*Syntax:* sync
*Example:* Console>sync

*Command:* **umount**

*Description:* Unmount a file system.
*Syntax:* umount <directory>
*Example:* Console>umount 5.0.0

Console>ls

ls: .: device not mounted

## *Discontinued Product Suppport*

Metrobility aims to offer high quality software support to our customers. In order to do this, it may be necessary to discontinue products with a diminished market demand, so that available resources can be used to develop newer technology desired by our customers.

This version of our embedded software provides only basic support for discontinued products, including the Lancast 10Mbps Fixed Port Chassis. Metrobility does not conduct extensive testing on discontinued products and full compatibility with the lastest software is not assured.

**Managed Fixed Port Chassis**

A fixed port chassis is similar to any other Metrobility chassis and the same commands are used to monitor and manage it. The only exception is that when referring to a specific a fixed port, an extra field, <-converter>, is required with the module number. The management card is always Module 1 on a fixed port chassis. The individual fixed ports are Module 2-*x*, where *x* is the number of the fixed port.

Examples.

Display module details for Fixed Port 9.

```
>show module 1 2-9
Location                        :  1/2-9
Name                            :  Module2-9
   :                                  :
Uptime                          : 7 days 12:32:30.48
Link Loss Carry Forward Oper    :  Disabled
```

Show port information for Fixed Port 12.

```
>show port 1 2-12
Location   Name         Status  Duplex  Speed  Type          ANeg  LLR       Activity  Connector
-------------------------------------------------------------------------------------------------
1/2-12/1   Port2-12_1   Link    Full    10Mb   e10BaseFL_SM  n/a   Disabled  Inactive  ST
1/2-12/2   Port2-12_2   Link    Full    10Mb   eBaseT        n/a   n/a       Inactive  RJ-45
```

Set LLR on the fiber port of Fixed Port 8. The fiber port is Port 1.

```
>set port LLR 1 2-8 1 enable
LLR successfully set.
```

Set LLCF on Fixed Port 3.

```
>set mod LLCF 1 2-3 enable
LLCF successfully set.
```

**Persistence for a Fixed Port Chassis**

When a management card is installed in a fixed port chassis, the software can be used to override the LLCF/LLR switch settings. Upon initial boot-up, the management card reads the position of the LLCF/LLR switches and sets the ports to match the settings. This information is saved in a persistence data file.

Following a reboot, the management card reads the position of the LLCF/LLR switches and compares them to the persistence data file. Persistence works as outlined below.

1. If the switch settings match the settings in the persistence data file, the software settings will be enforced, and the persistence data file will be unaffected.

2. If the switch settings do not match because a change was made, the new hardware switch setting takes precedence. All other software settings will stay the same.

Pushing any LLCF or LLR hardware switch takes effect immediately.

## *Product Safety and Compliance Statements*

This product complies with the following requirements and protocols:

- Internet Protocol RFC 791
- Address Resolution Protocol RFC 826
- Simple Network Management Protocol RFC 1157, 1902
- MIB-II RFC 1213
- Boot Protocol (BOOTP)
- File Transfer Protocol (FTP)
- Reverse Address Resolution Protocol
- UL
- CSA
- CE
- FCC Part 15, Class A
- EN55022 Class A (emissions)
- EN55024: 1998 (immunity)
- DOC Class A (emissions)

This product shall be handled, stored and disposed of in accordance with all governing and applicable safety and environmental regulatory agency requirements.

The following *FCC* and *Industry Canada* compliance information is applicable to North American customers only.

***USA FCC Radio Frequency Interference Statement***

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

***Caution****: Changes or modifications to this equipment not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

***Canadian Radio Frequency Interference Statement***

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

## Warranty and Servicing

**Three-Year Warranty for the Metrobility Management Card**

Metrobility Optical Systems, Inc. warrants that every Metrobility management card will be free from defects in material and workmanship for a period of THREE YEARS from the date of Metrobility shipment. This warranty covers the original user only and is not transferable. Should the unit fail at any time during this warranty period, Metrobility will, at its sole discretion, replace, repair, or refund the purchase price of the product. This warranty is limited to defects in workmanship and materials and does not cover damage from accident, acts of God, neglect, contamination, misuse or abnormal conditions of operation or handling, including overvoltage failures caused by use outside of the product's specified rating, or normal wear and tear of mechanical components.

Metrobility supports only the current released version and the most recent previous minor version of the software embedded on the management card.

To establish original ownership and provide date of purchase, complete and return the registration card or register the product online at www.metrobility.com. If product was not purchased directly from Metrobility, please provide source, invoice number and date of purchase.

To return a defective product for warranty coverage, contact Metrobility Customer Service for a return materials authorization (RMA) number. Send the defective product postage and insurance prepaid to the address provided to you by the Metrobility Technical Support Representative. Failure to properly protect the product during shipping may void this warranty. The Metrobility RMA number must be clearly on the outside of the carton to ensure its acceptance.

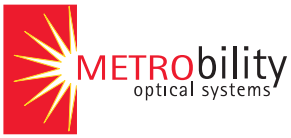
Metrobility will pay return transportation for product repaired or replaced in-warranty. Before making any repair not covered by the warranty, Metrobility will estimate cost and obtain authorization, then invoice for repair and return transportation. Metrobility reserves the right to charge for all testing and shipping costs incurred, if test results determine that the unit is without defect.

This warranty constitutes the buyer's sole remedy. No other warranties, such as fitness for a particular purpose, are expressed or implied. Under no circumstances will Metrobility be liable for any damages incurred by the use of this product including, but not limited to, lost profits, lost savings, and incidental or consequential damages arising from the use of, or inability to use, this product. Authorized resellers are not authorized to extend any other warranty on Metrobility's behalf.

**Product Manuals**
The most recent version of this manual is available online at
http://www.metrobility.com/support/manuals.htm

To obtain additional copies of this manual, contact your reseller, or call
1.877.526.2278 or 1.603.880.1833

**Product Registration**
To register your product, go to
http://www.metrobility.com/support/registration.asp

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